FADING AWAY

STRATEGIC OPTIONS TO ENSURE THE PROTECTION OF AND ACCESS TO OUR AUDIO-VISUAL MEMORY

TASK FORCE ON THE PRESERVATION AND ENHANCED USE OF CANADA'S AUDIO-VISUAL HERITAGE

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TABLE OF CONTENTS

PREFACE	*page i*
EXECUTIVE SUMMARY	*page 1*
INTRODUCTION	*page 4*
1. ASSESSING THE SITUATION	*page 10*
2. BUILDING AN AUDIO-VISUAL HERITAGE	*page 13*
3. PRESERVING THE AUDIO-VISUAL HERITAGE	*page 24*
4. ACCESSING THE AUDIO-VISUAL HERITAGE	*page 33*
CONCLUSION	*page 42*
RECOMMENDATIONS	*page 44*

APPENDICES ***(attached as electronic files only)***

Appendix A	*Audio-Visual Repositories in Canada: A Preliminary Survey*
Appendix B	*Selection Factors for Audio-Visual Archives*
Appendix C	*Analysis on Audio-Visual Targeted Consultation*
Appendix D	*Some Observations on Audio-Visual Heritage Programs in Other Countries*
Appendix E	*Preservation of Media*
Appendix F	*Useful Information on Canadian Policies and Legislation on Audio-Visual Heritage*
Appendix G	*Bibliography*

PREFACE

Canadians possess an exceptionally valuable cultural heritage, and without it, there cannot be a complete understanding of who we are, where we have come from, and the unique and common experiences which create our individual and shared identities. Film, video and sound recordings are vital components of our collective memory. They are the animate testimonials of our achievements over the past 100 years, documenting for all generations to come the hopes, the successes and the differences that have informed the views we hold of ourselves, of the world and of our visions for the future.

This vast source of information, inspiration and creativity — the most known contemporary archive of our society — is threatened. Through technological obsolescence, negligence and physical degradation of audio-visual materials, we are losing large parts of our recorded past. As we celebrate the centenary of cinema with only one of the first 20 feature films produced in Canada still remaining, we are forced to acknowledge the fragile nature of these media and the need to take concerted steps to make certain that we do not sacrifice more of this irreplaceable legacy through inaction and neglect — that we do not fragment and lose this knowledge of ourselves.

At a time when resources are strained in all sectors, and efforts are geared towards the continued development of new technologies and their creative application in our daily lives, we must recognize that archives — and particularly audio-visual archives, as fundamental components of the world's memory and of Canada's — are one of the most appropriate means of contributing to the development of our society. This development will only be possible if we can focus energies and resources on preserving this memory — to retain those elements of our audio-visual heritage which mirror our values, our culture and our evolution as a society.

The **Task Force on the Preservation and**

Enhanced Use of Canada's Audio-Visual Heritage has brought together individuals with a great wealth of experience and expertise to address these issues. Together they have crafted an inspired action plan that can endow present and future generations with the opportunity of enjoying the films, video and sound recordings held in repositories in all provinces and territories — both the productions of the past decades as well as those which will come in the future. For this we owe the many contributors to the Task Force a great debt of thanks.

It has been my privilege to participate in this important endeavour and to assist in the development of a framework for ensuring that our audio-visual heritage will be identified, preserved and made accessible to Canadians. It is now time to demonstrate in very tangible measures our commitment to the realization of the Task Force recommendations and to move rapidly from intention to action.

Jean-Pierre Wallot
National Archivist of Canada

EXECUTIVE SUMMARY

Vital elements of Canada's audio-visual heritage are disappearing, deteriorating and becoming inaccessible — and the rate of these alarming losses is accelerating. Audio-visual materials are inherently fragile, subject to rapid physical degradation and technological obsolescence. Urgent intervention is required as film, sound and video formats that served to record significant periods in Canada's history and cultural production are quickly reaching the end of their life expectancy.

In 1994, the Minister of Canadian Heritage expressed his support for the creation of the *Task Force on the Preservation and Enhanced Use of Canada's Audio-Visual Heritage*, with a one-year mandate to study these pressing issues and develop a comprehensive strategy to address their implications. Under the leadership of the National Archives of Canada, a community of stakeholders undertook this process — industry organizations including producers, broadcasters and distributors; cultural institutions including archives, libraries and museums; various national and regional communities including First Nations, ethno-cultural groups and artists' collectives; as well as the participation of user groups and funding agencies.

In this report, the Task Force presents the results of its deliberations: a set of forward-looking recommendations designed to ensure the systematic identification and survival of Canada's audio-visual heritage, as well as its enhanced use. The strategy is founded on a **collective, community approach that fosters shared responsibility, cooperation and decentralized authority**, and strives to bring about workable solutions within Canada's geographic and economic reality. It promotes **an integrated, holistic view of the management of heritage holdings** that considers the full cycle from creation, to identification as part of the country's heritage, to physical preservation and user access.

A key strategic component involves the

development of **selection criteria** that will facilitate the identification of material of enduring value from among the increasing volumes of current and future production. Effective selection criteria developed by the community will serve to build the heritage that reflects the richness and diversity of this country's cultures and society, and will prevent irretrievable gaps in our collective memory. A selection process that sets firm priorities will also serve responsible resource allocation. The high cost of maintaining and preserving audio-visual materials requires that scarce resources be directed to the most cherished and most threatened holdings. Many collecting organizations have been struggling to process large volumes of existing holdings which must also undergo selection.

Close examination of practices and procedures have led to recommendations concerning operational activities that reflect the audio-visual community's commitment to increasing efficiencies, eliminating duplication and setting firm collective priorities. These efforts must be supplemented by **transitional funding** if this strategy is to make a meaningful impact on saving rapidly deteriorating media, and if it is to bring about integrated mechanisms to ensure that future production is not subjected to similar risk. These requirements consist of $2 million (cost-shared for non-federal stakeholders) combined with $2 million (for federal agencies) per year over 10 years to safeguard the highest priority materials at risk in the existing holdings; a Preservation Fund generating a minimum of $2 million annually for current and future holdings; $1 million over three years to set up a specialized service centre; and $\$^1/_2$ million over 5 years to support training and exchange. To achieve these goals, a variety of funding mechanisms are proposed including cost-shared programs, tax incentives and contributions.

Recognizing that prevention is the most cost-effective means of preservation, the Task Force recommends an **improved infrastructure** for the storage and preservation of audio-visual materials. All organizations must ensure that the heritage collections entrusted to their care are stored under adequate environmental conditions that include temperature and relative humidity controls. To respond to the specialized preservation requirements of audio-visual records, the Task Force

recommends the creation of several **regional storage facilities** (specified through a feasibility study) to be available under common service arrangements. To complement this preventive measure, the Task Force recommends the creation of a centre of expertise providing technical support for obsolete and deteriorated formats to be established at the National Archives of Canada and to operate on a cost-recovery basis.

Other recommendations propose practical mechanisms for integrating preservation concerns into relevant regulatory and program areas within federal jurisdiction (including copyright), for improving access through standardized collection descriptions that can be readily shared through **networks**, and for balancing the need to facilitate user access and preservation copying with the need to ensure the protection of intellectual property rights. New **digital technologies** offer promising possibilities for preservation and access to audio-visual material, and the audio-visual community is committed to participating in the development of these applications.

Finally, to bring about this comprehensive and collective vision for the survival of Canada's audio-visual heritage, the Task Force proposes founding a new organizational structure — a **Consortium of stakeholders** charged principally with implementing this strategy. To respond to the urgent need for community action, the Department of Canadian Heritage and the National Archives of Canada should undertake the joint responsibility of establishing the Consortium within the next six months.

Decisive action, built upon a strong commitment to the preservation of Canada's endangered audio-visual heritage by the community of stakeholders, will be a fitting gesture for Canadians to mark the centenary of cinema in 1995 — safeguarding a heritage that spans over 100 years of audio-visual production.

INTRODUCTION

1. Background

Audio-visual materials are among the most threatened components of Canada's cultural heritage. Our society has become increasingly reliant on sound, film and video as recording technologies for public affairs, education, entertainment, commercial advertising, artistic expression and mementos of our daily lives. But, despite the prevalence and relatively recent appearance of these media, our preservation and access systems are facing a crisis. Irretrievable losses of milestones in our audio-visual heritage have already been suffered, and much of today's recording stands little chance of surviving for future generations to make their own judgement on its place in history. Canada's audio-visual legacy is fading away — taking essential traces of our culture and society with it.

An international movement to recognize the importance of the audio-visual heritage and the imminent threats to its preservation is mobilizing efforts throughout the world.

Since 1980, UNESCO has been urging member countries to undertake systematic long-term preservation of moving images. In 1995, the Council of Europe is set to launch an agreement on the moving image heritage, and the United States has completed a major study led by the Library of Congress and the National Film Preservation Board resulting in a national preservation plan for film. As countries are preparing to celebrate the centenary of the invention of cinema, they are also implementing the urgent actions required to safeguard this endangered heritage.

In Canada, mounting concerns for preservation have been coupled with equally strong interests in encouraging access and use. In 1994, the Minister of Canadian Heritage expressed his support for the creation of the Task Force on the Preservation and Enhanced Use of Canada's Audio-Visual Heritage to develop a comprehensive strategy addressing both aspects of this issue. Chaired by the National Archivist of Canada, the Task Force has

Of the 20 feature films produced in Canada between 1913 and 1929, only one has survived.

Only a few of Canada's earliest recordings of radio broadcasts still remain. These were recorded on glass discs during the 1920s and 1930s.

Thousands of hours of video recordings have been erased because the tape could be reused up to 200 times.

brought together the many private and public sector stakeholders — from those involved in creation, production and distribution, to those involved in collecting, preservation and use, and funding agencies. The participants, representing a diversity of interests and concerns, all share a firm commitment to immediate pro-active measures that will ensure the protection of Canada's film, sound and video heritage and will facilitate continued access and enjoyment.

Audio-visual media have become essential carriers of collective memories from the past and emerging voices of the future. In the present, audio-visual production thrives as the essential currency of vital cultural industries that reach out beyond our borders bringing Canadian perspectives into a global context. Viewed as an integral element of our cultural and economic development, Canadian audio-visual content must survive if we are to continue to express ourselves and to know each other — through traditional heritage venues and through the information highways of the future.

2. Approach to Developing a Strategy for Canada

Beginning with an assessment of the current situation, the Task Force set out to analyze the issues that exert an impact on audio-visual preservation in Canada. Seeking cooperative solutions tailored to practical implementation within the Canadian milieu, all stakeholders recognized that the strategy should build on existing institutional and commercial infrastructures, legislative and regulatory frameworks, and effective use of present resource levels. Current methods of managing audio-visual holdings were reviewed with a particular concern for duplication. Approaches to sharing and rationalizing mandates were promoted, and new efficiencies offered by technological developments were sought. The implementation approach relies heavily on focusing priorities and sharing responsibilities and expertise.

However, there will be a gap between what stakeholders can achieve with current funding levels, and what must be done to implement mechanisms that will stabilize and reverse the losses to existing and future elements of our heritage. To bridge that gap, the Task Force

recognizes that there is an unavoidable need for some new sunset funding to ensure that timely action is taken on the most urgent preservation issues, and to effect a transition to a fully operating strategy.

The composition of the Task Force which includes front-end creators through to archivists responsible for long-term preservation, as well as related users and funding agencies, has opened a far-reaching dialogue among all the parties. It reflects the premise 1) that cultural institutions such as libraries, museums, archives and galleries cannot bear the sole responsibility for preservation and access, and 2) that the holdings of broadcasters and producers are a rich and active component of this country's audio-visual heritage. Common problems were identified with a view to cost sharing and cooperative solutions. A comprehensive vision of working together emerged from this dialogue, and this is what the new initiatives will build upon.

Coming to terms with a changing environment

The growing concern for the audio-visual heritage began with an acknowledgement that institutions charged with the protection of these materials are rapidly losing ground in fulfilling their responsibilities and are increasingly finding themselves unable to respond to the new challenges posed by audio-visual media. Traditional approaches to collections management and resourcing have provided only limited solutions to the unique requirements of these records — from issues of sheer volume and selection, to description for effective retrieval and control, to access and intellectual property rights, to the pressing preservation concerns for physical deterioration, and the constant technological changes that complicate the preservation task with inevitable and often very rapid obsolescence of recording materials and formats.

As collecting institutions have struggled to address their responsibilities from the preservation point in the cycle, creators and producers have come to recognize the immense value of the audio-visual heritage as an essential building block for new production and ongoing programming. Yet, their role within the production-preservation-access cycle has been limited by a need to concentrate on immediate economic concerns, with preservation as a

secondary or supporting function. Meanwhile, users of the audio-visual heritage are increasing steadily as researchers turn to its documentary value, as artists draw upon it for creative sources, as the media and the industry strive to explore new applications and commercial possibilities.

This environment has brought audio-visual preservation and access to the forefront of heritage and culture concerns, and marks the landscape in which the Task Force undertook its deliberations. Oriented to realistic and effective implementation in this context, the approach taken throughout the study has been characterized by two key features:

- a consideration of the whole CYCLE of production-preservation-access as an integrated process, to arrive at a comprehensive forward-looking strategy — calling on partnerships and shared responsibilities throughout the cycle — and looking to solutions in new technologies; and

- a respect for the essential LINKAGES that work hand-in-hand in the audio-visual environment — preservation and access; cultural values and economic contributions; and, concerns not only for the preservation of existing holdings but also for current and future production.

3. Structure and Methodology

The *Task Force on the Preservation and Enhanced Use of Canada's Audio-Visual Heritage* included three activity levels:

- The Steering Committee, chaired by the National Archivist of Canada, included heads of cultural agencies or organization representatives who set out the study framework, directed the strategy development and established the recommendations presented in this report.

- The Study Committee, composed of experts currently involved in the administration of audio-visual operations and funding structures, was responsible for carrying out the study, developing the strategy according to parameters set by the Steering Committee and recommending an implementation plan.

- A group of specialists in technical, operational, legal and policy aspects acted as resource persons providing specialized advice to the Study Committee. They prepared discussion documents and conducted relevant research, development and analysis as issues were raised.

To assist in framing the Task Force discussions, two major initiatives were undertaken:

- A survey of audio-visual repositories was conducted to obtain an overview of the current state of holdings and services in this country. It covered the extent and types of media, storage conditions, preservation and copying facilities, as well as providing a profile of the organizations which are responsible for collecting, preserving and servicing these holdings.

- Cross-Canada consultations were conducted to provide an opportunity for broader community input on the identification of the problems being experienced, perceived needs and possible solutions.

4. Contents of the Task Force Report

This report is the formal presentation of the strategy and recommendations resulting from the Task Force deliberations of the past year. The major issues and implementation approaches are discussed in three core content chapters dealing with building, preserving and accessing Canada's audio-visual heritage. A review of information gathering activities conducted by the Task Force precedes these, and a three-year schedule for implementation concludes the body of this report. The appendices offer some of the technical documents prepared during the Task Force deliberations, and are intended to respond to the overwhelming need expressed during the consultation meetings — that the knowledge gained by the Task Force be made available to the community.

This document strives to set out the broad environment within which audio-visual materials are created and used, to respect the range of interests that impact on each issue and to reflect the complex process of negotiating practical and responsible solutions. In this way, the report may also serve as a more general situation analysis on the state of the audio-visual heritage in Canada in the 1990s.

1. ASSESSING THE SITUATION

The survey and the consultations served as complementary methods for acquiring a broad base of factual information as well as a range of opinions and concerns from groups and individuals. The survey revealed the nature of the groups involved in preserving the audio-visual heritage, the extent and types of holdings and the issues being faced by the diverse CULTURAL INSTITUTIONS and INDUSTRY ORGANIZATIONS involved. From an initial list of 3,600 potential collecting organizations drawn from directories, a survey sample of 1,402 was selected: 426 (over 30%) responded. To augment and clarify the survey information, telephone interviews were conducted with some respondents.

Designed to provide an overview only, the survey was a first pass at developing an information base — a bench mark to assess more detailed findings in the future. The results did, however, offer a revealing profile of the current state of organizations and their audio-visual holdings for the purpose of the Task Force deliberations.

For example:

- 38% of survey respondents identified themselves as audio-visual archives having a mandate for long-term preservation

- almost 50% of all reported collections contain all three media. Sound recordings are the most common type of holdings (41%), video is second (39%) and film a distant third (20%).

A series of targeted consultations were held in nine cities across Canada in an effort to hear many voices on the issues in preserving and making available the audio-visual heritage. Members of the Task Force met with over 225 participants in nine cities — Vancouver, Edmonton, Winnipeg, Toronto, St. John's, Halifax, Fredericton, Montreal and Ottawa. The meetings were a forum for the exchange of information and views among creators, actors, producers, archivists, librarians, broadcasters, distributors, conservators, other professionals and

CULTURAL INSTITUTIONS *include archives, libraries, museums, galleries and are primarily concerned with building and preserving collections for public use.*

INDUSTRY ORGANIZATIONS *consist of creators and cultural industries including producers, distributors, broadcasters, stockshot libraries and laboratories.*

see Appendix A for a more comprehensive description of the survey and the results

see Appendix C for information on the consultations

specialists from museums, galleries and funding agencies, as well as users. They included the valued participation of First Nations, community groups and ethno-cultural groups who use audio-visual materials among vehicles of their cultural expression.

Summary profile of community concerns:

The survey results and the consultation process provided the Task Force with an overview of the key questions facing organizations, as well as an indication of possible creative solutions. Illustrating the convergence and divergence of interests in the community, this information set up a context for examining issues in greater detail.

The community has expressed the pressing need to develop and communicate SELECTION CRITERIA on what materials should be designated for long-term retention to constitute the audio-visual heritage. Resources are limited and choices must be made about which audio-visual materials are to be retained and preserved. Issues include lack of criteria that can be readily applied, the vast production output that must be evaluated, the time-intensive nature of the selection task, and whether identification must be retrospective, or whether it be conducted systematically through regulatory mechanisms or on a records scheduling model.

PHYSICAL PRESERVATION of holdings is an urgent and multi-faceted issue. Large components of the audio-visual heritage are rapidly deteriorating or becoming inaccessible due to obsolescence. Organizations need facilities, expertise and reliable information, particularly about preservation standards. Lack of proper environmental storage, the lack of access to obsolete playback and copying equipment, and the relatively short life span of most records emerge as primary issues. Based on survey data, it is estimated that over 60% of holdings are held in inadequate storage conditions. Solutions to alleviate storage problems must consider geographic proximity of organizations.

Standards for DESCRIPTION of holdings and NETWORK LINKAGES for sharing information are needed. The lack of information on what materials are held by organizations

There are an estimated eight million hours of materials currently held in audio-visual repositories. About half of this volume consists of production materials and original recordings.

78% of survey respondents have no film copying facilities

50% have no video copying facilities

36% have no sound copying facilities

over 41% of survey respondents use only manual description

8% have no descriptions of holdings

hinders both increased use and sharing of information by organizations seeking to avoid duplication in acquisitions and costly preservation.

There is optimism about new TECHNOLOGIES, particularly digital processing. However, there is great hesitation about its possible risks. Research and reliable information on emerging digital technologies and standards are needed.

Creators are particularly concerned to about ensuring the protection of intellectual rights, but organizations need better methods for identifying and locating COPYRIGHT owners. While there is growing recognition that intellectual property and commercial interests must be protected, users expressed frustration with the difficulties encountered in clearing rights for heritage materials, especially in non-commercial situations. In addition, under present copyright legislation, organizations with heritage material must obtain permission of the rights of holders before undertaking preservation copying.

The whole community is concerned about the lack of sufficient RESOURCES to address the scope of problems faced, transitional issues and particularly the urgent preservation issues relating to the materials at greatest risk. In many cases, the extent of materials to be preserved and managed is rapidly expanding, while funding for institutional activities is stagnant, or even diminishing.

Two-thirds of survey respondents are organizations with holdings open or accessible to the public.

69% of survey respondents were cultural institutions

31% of survey respondents were industry organizations

2. BUILDING AN AUDIO-VISUAL HERITAGE

One of our most complex challenges is identifying the steps in building a representative and lasting heritage from the vast output of audio-visual productions. We are already faced with irretrievable gaps in our audio-visual heritage, and yet our repositories struggle to cope with immense holdings. This critical issue is charged with two polar concerns: one which strives to be as inclusive and comprehensive as possible, and the other which must be selective and restrictive in the face of limited preservation facilities and resources.

Building and protecting a heritage means identifying the elements of past and present productions which frame our unique identities, and which have enduring informational and cultural values. We must also look ahead to establish the mechanisms that will provide a systematic and collective approach to coping with an expanding production base and an increasingly complex technological and societal environment. There is a pressing need to ensure that the most effective approaches to the preservation and enhanced use of unique AUDIO-VISUAL ARCHIVES are adopted, and that this heritage reflects the diversity of Canada's cultural production and the far-reaching presence of AUDIO-VISUAL RECORDS in our society.

Approaches taken by other countries offer comparative models for examining legislative, institutional and operational structures for audio-visual preservation and access, and for considering certain aspects that may be relevant to the particular situation in Canada. In France, legal deposit enacted in 1992 covers all recording media (published or broadcast) and includes a cultural heritage function as well as protection of intellectual property. Responsibility is assigned by media to national institutions, and a board oversees the law's application including formal selection directives. Significant resources were allocated to implement the programs related to this legislation. Norway has legal deposit and a national strategy that incorporates production, distribution,

AUDIO-VISUAL RECORDS: A record is information in any form regardless of format or media: audio-visual records consist of moving images (films and videos) and sound recordings, including radio and television productions in all media (excluding fixed images such as photographs).

AUDIO-VISUAL ARCHIVES: Audio-visual records in all media produced and / or received by an individual, a public or private organization. This includes textual or graphic documentation or unedited footage which can explain the production context of an audio-visual work.

AUDIO-VISUAL ARCHIVES OF ENDURING VALUE: Audio-visual records in any media, produced or received by an individual, public or private organization and which are selected for permanent preservation because of their evidential and general information value, or their cultural value. This includes selected textual and graphic documentation and unedited footage. This is what constitutes the audio-visual heritage.

conservation and public access. In the United States, a national strategy and plan for film preservation has been developed under federal government direction and support. Australia's system is comparable to Canada's; however, a higher level of state funding supports aggressive collection programs. The state film finance corporation and film commission contracts both require preservation deposits.

see Appendix D for a discussion of heritage initiatives in other countries

2.1 Towards Collective Responsibility

The survey groundwork revealed that, in Canada, there are presently some 3,600 organizations with audio-visual holdings, ranging from industry organizations to cultural institutions. This diversity is reflected in an equal range of purpose and method behind their collections — with some directly linked to particular business interests, some to the legislative requirements placed on government institutions and some linked to specialized collective or eclectic mandates. In addition, there are countless individual creators and informal structures maintaining elements of their production activities.

It is from the holdings of this multi-faceted community that the audio-visual archives of enduring value are ultimately drawn. In some cases, the heritage components have survived by chance. Others have deteriorated and disappeared even before an informed assessment of long-term value could be made, or before protective measures could be afforded. While strong initiatives to preserve the audio-visual heritage have been undertaken, these efforts have been lacking coordination. Therefore, the Task Force proposes a set of systematic mechanisms that will direct and manage the survival of the audio-visual heritage by design. An integrated preservation management strategy will not only link all aspects of selection, preservation and access within individual organizations, but will also strive to establish linkages among the community of stakeholders for a broadly-based system with clear collective priorities.

Sharing management and responsibility

There is a marked concentration of holdings and incumbent responsibilities in a very small number of large cultural institutions. Based on the survey responses, it is estimated that:

- 61% of film is held by five organizations
- 59% of sound is held by ten organizations
- 58% of video is held by eight organizations
- with the remainder dispersed among hundreds of smaller organizations throughout the country

The community has acknowledged the fundamental value of a distributed approach to the identification and management of Canada's audio-visual heritage.The highly specialized and costly requirements of audio-visual archives have effectively restricted participation by small organizations, leaving a few large organizations to acquire the heritage through their mandates and collecting practices.

A strong formal basis for shared responsibility must be implemented within Canada's audio-visual community. It must include cooperative mechanisms that enable equitable involvement throughout the country and promote coordinated management. The result will be a more representative heritage, with the practical advantages of resources coordinated on a broad community basis to avoid duplications and focus on priorities. The stakeholders, organized along national, regional, community (such as First Nations, ethnocultural groups, artists and others), or industrial (broadcasters, producers, distributors), or institutional (archives, libraries, museums) lines, have undertaken to form a broad partnership for the preservation of Canada's audio-visual heritage. As its first and primary recommendation, the Task Force maintains:

Recommendation 1

That the responsibility for the preservation of Canada's audio-visual heritage must be borne by a network of stakeholders operating in accordance with clearly defined mandates and jurisdictions to ensure broader protection and compatible access to Canada's audio-visual heritage and to allow a decentralized approach to the preservation of these cultural resources.

In fact, the participation of all partners in the preservation and access of the audio-visual heritage will build on the essential community links that have been forged. Allowing the community itself to make the decisions on the most effective management of this collective heritage will ensure that those responsible for the preservation and use of materials can properly be accountable for the results.

To provide comprehensive direction and management, a Consortium made up of organizations from all sectors including from user groups and right holders is proposed.

While there are some large commercial holdings, the heaviest volume of heritage materials is currently in the care of government agencies or cultural institutions - film, sound and video holdings with the National Archives of Canada, sound holdings with the National Library of Canada, and film holdings with La Cinémathèque québécoise.

While economies of scale have encouraged specialized storage and processing facilities, smaller organizations have been experiencing severe problems with accepting and processing audio-visual materials.

Smaller organizations need mechanisms through which they can contract for designated elements of physical control while retaining intellectual control and ownership.

With advances in technology, such mechanisms may lead to virtual archives where materials may be accessed via transmission of digital information from a centralized repository.

The Task Force recommends:

Recommendation 2

That a Consortium of stakeholders, as a charitable and non-profit corporation, be established to coordinate the implementation of the national strategy, and to undertake other projects and programs with respect to the preservation and enhanced use of the audio-visual heritage.

The responsibilities of the Consortium should include:

- fostering the development of detailed action plans and setting priorities in collaboration with the stakeholders in order to implement the national strategy for the preservation and enhanced use of the audio-visual heritage;
- managing projects and programs related to the preservation and enhanced use of Canada's audio-visual heritage: such as arrangement, description and cataloguing; copying; storage and maintenance; access; training and exchange of information; inventory of existing equipment, services and expertise;
- administering funds dedicated to the management of the audio-visual heritage;
- initiating, facilitating and supporting the identification/selection of the audio-visual heritage, the development of standards for effective storage and archival formats, and the clarification of rights;
- establishing and operating a modest secretariat to carry out these activities.

The terms of reference for the Consortium should be developed within the first six months of the implementation of the strategy, under the joint responsibility of the Department of Canadian Heritage and the National Archives of Canada, and in collaboration with Task Force representatives.

2.2 Constituting the Audio-Visual Heritage

Systematic criteria, integrated mechanisms and community support are required to sustain a framework that will successfully identify and preserve the elements of past, present and future production that constitute Canada's audio-visual heritage.

Systematic identification and selection for audio-visual archives

While cultural institutions strive for systematic management of their acquisition and preservation activities, they experience constant pressures to accept large volumes of endangered productions. This not only strains resources and capabilities, it also adds to huge existing accumulations of materials awaiting attention.

Developing, interpreting and applying selection criteria to focus collecting activities is an essential step in ensuring that heritage materials are identified and preserved. This process serves as a framework for determining how Canadian culture and societal values, in all their diverse manifestations, can be reflected in heritage collections. The community has expressed support for a shared approach that divides all audio-visual material into two broad groups: first, material for which selection guidelines, specific criteria and interpretation at local or specialized levels should be developed and systematically applied; and second, designated categories in which extensive losses have already been incurred. The Task Force recommends:

Recommendation 3

The stakeholders are responsible for identifying the elements that make up Canada's audio-visual heritage on the basis of general selection principles and criteria that reflect the values of Canadian society — assessing relevance primarily in terms of Canadian content, Canadian production and material of significance to Canadians.

However, considering their rarity, their archival value and the substantial losses that have already occurred, it is recommended that the following categories of material be given urgent consideration:

- audio-visual recordings (including unedited material) produced before 1940

selection factors for audio-visual archives include:

- *pertinence*
- *significance of document*
- *informational / evidential value*
- *aesthetic value*
- *research value*
- *form / medium*
- *uniqueness / rarity / age*
- *commercial value*
- *significance of creator / author / collector*

see Appendix B for further discussion

- Canadian films and sound recordings produced before 1950
- television and radio programs produced in Canada before 1960
- Canadian sound recordings produced and published before 1970
- Canadian video recordings in non-standard formats produced independently before 1980 and music videos from the same period

Mechanisms for selection and retention of audio-visual archives

Most organizations apply their particular legislated mandates, business interests or the interests of their sponsoring bodies to building their collections or to supporting others. While this ensures that a large volume of materials may be retained, it does not provide a global assurance that all the production of heritage value is being captured and properly maintained, nor does it provide a suitable context for ensuring a minimum of duplicated efforts. In fact, participants in the consultations indicated that the very nature of a highly decentralized production industry and the lack of singular purpose among cultural organizations has resulted in the loss of heritage materials and poses challenges that should be formally addressed by the community.

Recommendation 4

All stakeholders are responsible for establishing procedures for identifying and selecting the audio-visual elements of enduring value, both from their existing holdings and from current and future productions.

Among these things, the stakeholders should:

- ensure proper retention of audio-visual material, and develop selection criteria and retention schedules with assistance and expertise coordinated by the Consortium; these should be reviewed periodically by the stakeholders.
- allow time for some level of historical perspective and determine a minimum period of retention for all audio-visual material, where appropriate, before the application of selection criteria.
- allow input from representatives of user groups on selection criteria and intellectual and physical access, and develop consultation mechanisms.

Various mechanisms and conditions attached to legal, regulatory or contractual

There has been an explosion in the quantity of audio-visual productions in the last decade.

For example, Statistics Canada reported that, in 1991/1992 there were 742 film and video production companies in Canada creating almost 20,000 works - an increase of 25% in five years. This represented a total investment of $611.9 million including public support of $340.5 million.

Releases of sound recordings with Canadian content increased by 46% between 1988/1989 and 1992/1993.

arrangements in the federal context can be valuable tools for identifying and preserving a collective heritage and using public support more efficiently. One example used in many countries is mandatory deposit of published works. In Canada, deposit copies only cover a small component of audio-visual materials, being a useful means of capturing "published" works and productions made within commercial or institutional structures. Certain classes of production do not easily fit deposit definitions: for example, artistic works, those that do not inherently include a fixed recording process such as electronic transmission and small independent productions, unedited footage never presented to the general public, oral history and small independent productions. These form a significant part of our audio-visual heritage, yet they will remain among the most endangered unless avenues for their entry into preservation collections can be established.

The Task Force recommends:

Recommendation 5

That the following agencies and departments be urged to establish mechanisms to assist in the proper identification, selection and long-term retention of our audio-visual heritage:

- Canadian Audio-Visual Certification Office of the Department of Canadian Heritage, Telefilm Canada and the Canada Council as well as provincial and municipal funding organizations should ensure that a preservation component (original and/or a master) of audio-visual productions they funded is maintained in recommended storage conditions. Where this master is to be manufactured, the cost of the master should be considered as a legitimate production cost in the application for tax credit or protection funding.

- The Department of Canadian Heritage, in collaboration with the Canadian Association of Broadcasters, should promote the institution of a *"Day in the life of Canadian radio and television"*. All public and private broadcasters would be encouraged to record (on professional tape and at their expense), to document and to ensure the retention of one full day of programming annually. For the first year, it is suggested that this take place on the Monday of the third week in February — Heritage Day.

- With the cooperation of the Consortium, the Bankruptcy Superintendent Office should prepare and diffuse a circular to the trustees under the *Bankruptcy and Insolvency Act* to

In Canada, the audio-visual holdings of a few designated institutions include material acquired in the context of legal deposit clauses: commercial published music and video recordings at the National Library of Canada, and music recorded in Quebec at the Bibliothèque nationale du Québec. The National Archives of Canada is legally empowered to request all forms of audio-visual productions from all parts of Canada, while the Cinémathèque québécoise can request Quebec film productions.

A MASTER is a copy made to protect the original, and as such is used for archival preservation and subsequent preservation copying.

the effect that audio-visual productions of the bankrupt company or of companies are submitted to a stakeholder of the Consortium for an assessment of the archival value of the material.

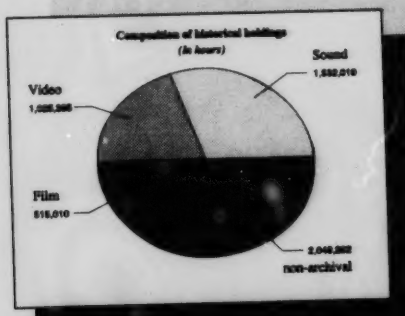
- The Department of Canadian Heritage should promote the use of the following standard clause for any cultural federal-provincial agreement referring to Canadian audio-visual material:

> Each party to this agreement must, subject to the *Copyright Act*, and the rights of copyright owners and the rights derived therefrom, enforce the preservation of moving image and sound recordings and other master material associated with multi-media productions, and facilitate access to them through institutions and organizations created for this purpose, such as archives, libraries, film libraries/cinematheques, museums, electronic means of dissemination, networks, etc., as the case may be.

Establishing priorities and a funding base

All representatives of the main sectors working with audio-visual expressed a firm commitment to the most effective allocation of resources for preservation management. As the custodians of Canada's audio-visual heritage, they view their activities as responsible investments to protect valuable cultural assets. Without a concerted investment strategy, irretrievable losses will occur.

The community's approach to the critical preservation requirements confronts two issues. Foremost are the actions required to manage the immense volumes of existing holdings. Urgent measures must be taken to protect irreplaceable heritage treasures before advanced degradation and obsolescence make salvage and restoration impossible. At the same time, organizations are struggling to process and provide proper care for the incoming volume that has increased far beyond available resources and capabilities. Organizations must emerge from these mounting pressures to undertake selection and pro-active and systematic preservation.



All participants agree that management decisions must be made to focus expenditures in the areas of historical value experiencing risk, that is, those archival records in original and obsolete formats. There are currently an estimated 5 million hours of historical film, video and sound recordings — more than 585 years of continuous viewing and listening. Within this important material, it is estimated that just over 200,000 hours are in the category of extremely high value. These **treasures**

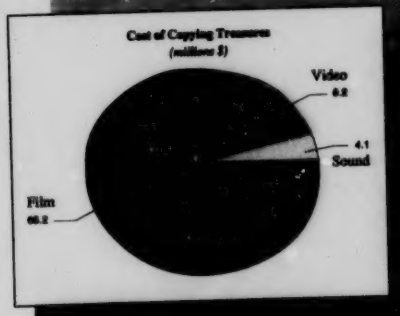
are often in the poorest physical condition, recorded on obsolete formats and in need of immediate attention. Most audio-visual treasures must be restored and copied so that present and future generations can enjoy these critical heritage components. Without taking steps to ensure the preservation of this critical body of recorded information, we will face losing this important component of our documentary and creative heritage. When the hardest choices have to be made, the treasures must be saved.

Action on preservation of the treasures of our audio-visual heritage requires a sizeable investment. Copying the materials in the most urgent need of care alone is estimated at $77.5 million, materials which have undergone judicious selection and been distilled to a small and precious quantity. The human and financial resources available are insufficient to meet the enormity of the task at hand. What limited resources exist must be spread over a large number of holdings, and preservation actions staged over a period of years. This compounds the problem as the longer the materials wait for attention, the poorer the condition, and therefore the higher the cost of preservation when measures are taken.

Recognizing that securing the safety of existing heritage holdings is of paramount importance, there is also a need to ensure that current and future production is not subjected to the same potential losses, and does not lead us into a continuing crisis with ever-mounting accumulations of material waiting for proper care. The Task Force insists that a comprehensive and forward-looking strategy is the second essential building block. We must integrate long-term preservation concerns into the very creation and maintenance of audio-visual production as the only cost-effective and realistic approach to an ongoing sustainable heritage.

To avoid the even higher cost of restoration and copying over time, the Task Force examined approaches to funding efforts to assist in preservation activities. Particular attention was paid to mechanisms which will augment the present investments being made by organizations, and which will attract other partners.

In 1995, estimated costs for copying film are $1,900/hour; for video $120/hour; and sound recordings $40/hour.



The Task Force recommends that:

Recommendation 6

To support intellectual and physical processing for the long-term preservation of Canada's audio-visual heritage, that the federal government should:

For the highest priority materials at risk in the existing holdings

- **establish a cost-shared program at a level of $2 million per year for ten years for non-federal stakeholders, and allocate an equivalent amount of $2 million per year for ten years to those federal agencies which are already preserving an important part of Canada's audio-visual heritage.**

For current and future holdings

- **facilitate the creation of a Preservation Fund, generating a minimum of $2 million per year to support preservation and/or restoration and intellectual and physical processing projects. The fund could include contributions (included in production costs and tax deductible, if applicable) from producers, individuals and private organizations (who could also benefit from tax deduction provisions) and contributions from any public organization.**

3. PRESERVING THE AUDIO-VISUAL HERITAGE

With each passing day, our audio-visual heritage deteriorates and disappears. And the rate of these alarming losses accelerates relentlessly. For much modern media, few years remain during which we can still retrieve and reformat from degrading supports and obsolete technologies. Unlike more stable information recording formats, audio-visual materials begin to deteriorate very quickly. Production and playback technologies are rendered obsolete within a few short years. Without concerted strategies and immediate action, we know that much of Canada's audio-visual heritage will soon be lost.

The rate of degradation and obsolescence of film, video and sound holdings far surpasses the current capability of government and private organizations to conserve them. Traditional conservation methods have been unable to cope with the growing volumes of records at risk. New approaches must be implemented to protect the vast quantities of audio-visual materials currently held by repositories, and preventive steps must be taken so that new productions have a better chance of survival into the future.

Preservation serves a multi-faceted function in audio-visual collections. It strives to protect the artifactual element of the original production format through preventive measures and restoration, and to retain information content through copying. But preservation is not an end in itself. Audio-visual materials are preserved so that they can be diffused and enjoyed, and so that the information within them can be retrieved. Preservation copying is the essential mechanism for serving this vital function — ultimately making the audio-visual heritage accessible to users.

The strategy recommendations in this section recognize the need to:

- establish a preservation infrastructure addressing the urgent need for

see Appendix E for a more comprehensive technical discussion of preservation issues

PRESERVATION includes all actions taken to ensure the long-term survival of the physical format and / or informational content of archival records.

PRESERVATION MANAGEMENT is a comprehensive, holistic approach that integrates preservation concerns into all the operational activities related to holdings. It considers the life-cycle of records and focuses on the needs of volumes of holdings (rather than the restoration of individual items).

PREVENTIVE CONSERVATION is an essential element in preservation management. It strives to prevent deterioration by providing optimum conditions for storage and handling, or to protect information content by copying to another format.

CONSERVATION TREATMENT refers to actions taken to stabilize or reverse damage that has taken place.

technical support for organizations coping with the physical and technological instability of audio-visual materials;

- apply systematic preservation management to the care of holdings, responding to the particular requirements of audio-visual media and the whole life-cycle of audio-visual records; and

- establish pro-active mechanisms to facilitate the preservation of audio-visual materials — past, present and future productions.

3.1 Preservation Infrastructure to Serve the Whole Community

Many audio-visual holdings are threatened by the degradation of the very materials with which they are created. For example, the images on nitrate and acetate film stocks are subject to rapid deterioration once the inevitable decomposition of the base stock begins. This has been the cause of the loss of some of the earliest moving images in Canada. With the introduction of magnetic sound and video recording, the rapid shifts in technology have meant a constant investment to copy materials from one format to another to retain the information. Faced with these extreme situations, stakeholders responsible for the audio-visual heritage have been forced to make extremely hard choices, allocating their limited resources to saving certain elements and having no recourse but to let others deteriorate and disappear.

In this section, the Task Force recommendations establish the most cost-effective measures that each organization can take to protect its holdings, beginning with prevention. When conservation treatment and preservation copying is required, firm priorities must be set to focus

scarce resources on the heritage materials at greatest risk. This approach must be supported by a collective infrastructure that can offer very specialized services and information with centralized economies of scale while still maintaining the essential characteristic of community-based responsibility for management.

Storage first and foremost

Proper storage conditions with stable temperature and relative humidity at appropriate levels offer one of the most cost-effective solutions for preservation of audio-visual materials. Research has convincingly shown that the rate of deterioration accelerates with a poor storage environment. Left in uncontrolled conditions, colour films may begin to show signs of degradation in a matter of only two or three years. But lowering and stabilizing temperatures and relative humidity will significantly slow, or event halt, organic pigment degradation. Without proper storage and maintenance, video will deteriorate in as little as five years.

The survey revealed that most audio-visual materials are currently stored under conditions suitable for human occupancy but not for audio-visual material — sometimes air-conditioned, rarely humidity controlled. Very few organizations offer vaults designed to meet standards for audio-visual storage which specify temperature, relative humidity, as well as dust and contaminant controls. Fewer still have cold storage for colour film at or below 0º Celsius. In addition, appropriate containers, reels and individual housings which can prolong the life of audio-visual materials are not always used.

Respondents to the Task Force consultations and expert advisors have been very clear that the most cost-effective investment for preservation is in storage facilities. Providing storage that meets long-term preservation standards will reduce downstream costs of restoration and copying, loss of materials, and importantly, will buy time for threatened holdings. All organizations acknowledge that their primary preservation efforts and resources should be directed to improving their storage conditions, in particular by controlling the level of temperature and relative humidity of their existing storage facilities to meet current standards. However, shortages of space and the lack of capital

There is marked life span improvement for colour film in cool and dry conditions (4.4 degrees C, and 25% -+ 5 RH), and best results are achieved in specialized sub-zero vaults.

See Appendix E for a table showing the life expectancy and recommended storage conditions for the many types and formats of audio-visual media.

resources necessary to achieve the specialized range of conditions which will ensure the preservation of various audio-visual materials make the task very difficult, particularly for smaller organizations.

The Task Force has concluded that, for certain formats requiring more specialized services, five or six appropriate storage facilities should be made available across Canada, and operated on common service arrangements. These costly facilities must be concentrated to take advantage of economies of scale. The overwhelming priority expressed by the community during the consultations was for improved storage, and the survey confirmed that much of Canada's audio-visual heritage was currently housed in sub-standard conditions. Therefore, the Task Force recommends:

Recommendation 7

That, given the critical importance of adequate storage, common regional storage facilities (the limited number and location to be determined by a feasibility study) be established where necessary.

The upgrade of existing facilities to current standards, when appropriate, or the construction of new facilities can be supported by a program such as the Infrastructure Program.

Access to specialized services

Not only are audio-visual materials physically threatened by the very nature of the products used in their manufacture and by sub-standard storage conditions, but the information may also become irretrievable because of the loss of technological capability. The pace of technological change renders more and more heritage material inaccessible as the market moves to newer formats. For some formats, such as 2" Quadruplex, commonly used in television recordings up to the 1980s, there are very few systems in Canada for the playback, and therefore copying of these recordings. Commercial laboratories capable of handling older film formats are few. Organizations interested in the long-term preservation of the materials in their care are faced with the need to gain access to specialized facilities, equipment and expertise to preserve, duplicate and transfer these materials to other formats. This will be an ongoing concern for organizations as recording technologies continue to evolve.

Organizations reported that almost 60% of audio-visual holdings are stored in inadequate to poor conditions. In addition, over 20% are stored under a range of conditions in outside service arrangements because facilities are not available within the organization (see survey results in Appendix A).

Participants in the cross-Canada consultations expressed strong support for the concept of regional storage facilities where material can remain accessible to organizations and benefit from proper storage (see Appendix C).

Survey results showed that only 64% of organizations with sound recordings have copying facilities. For film, the figure is only 21%. Only 6% of organizations can provide copies of materials other than 16mm and 35mm (see Appendix A).

Few cultural institutions have a full range of capabilities to copy materials in all media and all formats. Where this capability exists, it is often not accessible to other institutions, even on a fee-for-service basis. And yet, making copies of certain materials in obsolete formats or on very unstable material bases is the only method of ensuring the long-term preservation of the information. Therefore, there is a real need expressed by many organizations to broaden access to technical and laboratory facilities, as well as to facilitate exchange of specialized information on the availability of equipment and expertise. The Task Force recommends:

Recommendation 8

That a single centre, operating on a cost-recovery basis, be established on the premises of the National Archives of Canada to address the problem of obsolete formats and to provide specialized services for the stabilization and the restoration of severely deteriorated and/or damaged film, video and sound archival records.

- To implement the creation of this single service centre for obsolete formats and deteriorated and damaged media, special funding at a level of one million dollars over three years would be needed to train staff and to equip laboratories.

- This centre may associate, when necessary, with certified public and private centres of expertise (such as the National Film Board of Canada on colour film remastering).

3.2 Elements of Audio-Visual Preservation Management

Present attempts to preserve the audio-visual heritage start with preventive measures and focus on storing, maintaining and copying the large volumes of materials already held by organizations. Efforts are aimed at conserving artifactual and informational contents, such as video and sound recordings which must be moved from obsolete to current formats. Resources are expended in transferring information on fragile base materials to more stable, archival quality supports. For example, films are copied from degrading acetate film stocks to the longer- lasting polyester materials. These are the essential day-to-day activities conducted by repositories in the systematic management of audio-visual holdings.

The following recommendation emphasizes the integration of preservation concerns into the overall management of collections and presents the accepted professional practices relating to specific media and formats.

The Task Force recommends:

Recommendation 9

Stakeholders should integrate preservation management and conservation measures (including preventive conservation) at every point in the record cycle:

- All film originals should be preserved as long as possible. *It is recommended that polyester-based film stocks be used for masters. All film should be stored at recommended low temperature and relative humidity levels and monitored by acid detection technology and periodic colour evaluation for fading and loss of contrast.*
- All magnetic recordings (audio and video) should be stored at recommended low temperature and relative humidity levels for extended term storage. *However, because these formats tend to become obsolete very rapidly, these records should be re-recorded onto a digital format to preserve the program content.*
- To provide access and to protect master material (obsolete or recent formats), reference copies should be available for researchers, with secure access to respect the rights of the owners of copyright and those who derive their rights from copyright, and in a manner that avoids competition with commercial sources. *Reference copies may be made on less costly media.*

3.3 Looking to the Future

A forward-looking approach is vital to reduce costly downstream conservation, to find the most efficient and reliable means of preservation and to ensure that the community can keep up with the heritage concerns related to current and future productions. To address these aspects of the strategy, the Task Force has considered new technologies, research and standards development, continuing training and legal empowerment that can have a positive impact on preservation.

Research and standards

The increasing applications of digital recording formats for video and sound promise much more than an incremental technological improvement that perpetuates the obsolescence cycle. As developments in integrated system design open possibilities of making certain archival records "format independent," DIGITAL PROCESSING will bring dramatic changes to a range of archival activities — from selection, to storage and preservation, to access and use. Digital technology introduces the ability to compress information. This allows for efficient storage of information, with nearly a ten-fold increase in the storage capacity of a digital archive at a comparable cost to the status quo. It also holds great potential for more effective transmission of information in networked configurations, allowing distant access to archival holdings.

Faced with critical preservation issues, audio-visual archivists are quickly recognizing the benefits of digital processing. However, there are a number of outstanding concerns which must be addressed before heritage organizations can take advantage of these new possibilities. Research is required to assess distortions caused by compression technologies, and there is continuing uncertainty about stability of information and media over time. Heritage interests are determined to take an active role in these investigations due to the great potential for cost savings when digital technology and digital compression are employed for data storage. But before it can be done, the Task Force recognizes the necessity and recommends that:

Recommendation 10

Research should be conducted to determine the specifications for a recording medium for extended term storage.

- The requirements for ongoing scientific research into the

DIGITAL PROCESSING is redefining the production industry. It is paving the way for instant access and graphic processing speed, unlimited image and sound manipulation and transparent copying. Archivists are looking to digital recording for solutions to preservation and access issues related to recorder format obsolescence and magnetic media storage life (see Appendix E).

Digitization allows transparent copying: every copy is an original. The information content becomes the integral archival record released from its attachment to a unique support or recording base.

The integrated application of digital processing to preservation management presents theoretical challenges to traditional archival practice founded on evidential value, authenticity and authorship. As more production occurs in the digital environment, this may alter the theoretical implications of the simulacra in the archive.

preservation of audio-visual media, both recent and obsolete, should be quickly defined by the stakeholders, and the Canadian Conservation Institute and the Communications Research Centre are urged to cooperate with public and private, foreign and domestic, research laboratories and manufacturers of digital equipment to develop appropriate research programs.

In addition to the digital environment, standards issues continue to be of vital importance in all aspects of audio-visual preservation. The interests of longevity of materials and the information recorded on these materials does not always emerge as an issue in the development of new products or technologies. This results in downstream problems and more costly solutions for those responsible for the safekeeping of the audio-visual heritage. To solve this problem up front, the Task Force recommends:

Recommendation 11

That Canada, through its representatives in Canadian and international standardization organizations (the Canadian General Standards Board, the International Organization for Standardization, the Society of Motion Picture and Television Engineers and others) continue to work actively on the development of standards governing the manufacture of durable media and to promote recognition of standards among the stakeholders.

Developing and maintaining specialized skills

Organizations and individuals involved in the preservation of audio-visual materials expressed a need for access to training and information. More organizations are becoming involved in the preservation of audio-visual records and require basic information on how to proceed. Those already involved require skills development and information about changes in preservation standards and practices. Much of the information sought is highly specialized and requires reliable interpretation on its applicability to archival preservation.

Preservation training is offered in a very limited number of educational institutions across the country. It is not specifically adapted to the needs of organizations with audio-visual holdings, and expertise must be developed on the job. The skills required to operate and maintain obsolete media

During the consultations, participants were explicit about the need for training and expert knowledge as prerequisites for a shared responsibility for Canada's audio-visual heritage.

disappear with the technology. Sustaining this expertise, as well as the artisanal ability to fabricate repairs when parts are no longer available, will continue to be a major factor in the community's ability to preserve obsolescent elements of our audio-visual heritage. Looking to the future, the new skills required to apply digital technology to integrated archival operations must also be developed. To increase the circulation of expertise and information, the Task Force recommends:

Recommendation 12

A training and exchange program on the preservation of audio-visual support media, including the organization of and participation in seminars, conferences, hands-on training, publication of advisory information, and other such activities in Canada and abroad, should be set up by the new Consortium.

- This program should serve the needs of conservators, technicians, archivists and creators in the various kinds of organizations with archival holdings, both public and private. Post-secondary institutions should also be encouraged to participate in establishing a program in audio-visual engineering and media preservation.
- The financial requirement for this program, estimated at a level of half a million dollars over five years and should be managed by the new Consortium. The funding could be allocated from existing federal programs.

Legal empowerment for preservation activities

Cultural institutions encounter legal impediments during their preservation activities. Within its intent to prevent unauthorized use, copyright also restricts preservation copying for archival purposes. Cultural institutions must be empowered to conduct preservation activities to protect this country's audio-visual heritage without risk of contravention of rights, specifically where these activities occur on site and do not expose the works to unauthorized copying, diffusion and use. Complementing Recommendation 18, where the implications of this issue on access are addressed, the Task Force recommends:

Recommendation 13

Without re-examining the general measures being contemplated as part of the Phase II copyright revision, that the Departments of Canadian Heritage and Industry Canada include provisions in the Canadian Copyright Act to permit the copying of Canada's audio-visual heritage for preservation purposes.

At present, the COPYRIGHT ACT does not permit the production of preservation copies by organizations without the prior authorization of the copyright holder. It is often difficult or impossible for many parts of Canada's audio-visual heritage to establish who holds copyright.

4. ACCESSING THE AUDIO-VISUAL HERITAGE

Framing the discussion of audio-visual archives in terms of a cultural heritage means collective sharing, enjoyment and appreciation. It also means fostering a productive environment for continued creation that will nourish a living and growing culture and industry. Balancing accessibility and the demands of today's users with the responsibility for long-term preservation for future generations is one of the central challenges faced by all those responsible for Canada's audio-visual heritage. To address the pressing need for developing approaches and systems which will enable users to benefit from the richness and diversity of their heritage, the strategy recommendations recognize:

- that improved mechanisms for sharing of information are essential for access and preservation management;
- that existing and emerging technologies must be exploited to provide integrated and broad-based access to information about holdings, as well as to the holdings themselves; and
- that improved mechanisms are required to balance the need to facilitate access with the need to ensure the protection of intellectual property rights.

4.1 Sharing Information

Comprehensive, consolidated information sources are the key to improving access for researchers and commercial users. New technologies are offering effective means for capturing and diffusing information about the audio-visual heritage and for making it available to users throughout Canada and abroad.

From basic description to community linkages

The use of audio-visual materials is critically linked to description — knowing what the holdings are, where these are located and the conditions under which use is permitted. Over the years, many organizations have accumulated extensive holdings without having the resources to describe these records. Incomplete and incompatible description has impeded access, preventing users from obtaining a comprehensive understanding of what is held by individual repositories and from determining what holdings are unique to a particular institution, what exists elsewhere and who rightfully regulates use. While completing descriptions for unprocessed holdings will be a major undertaking for organizations, the Task Force recognizes that, without this effort, large parts of our audio-visual heritage will remain inaccessible and recommends:

Recommendation 14

That all stakeholders prepare and maintain electronic inventories of their holdings; that they be encouraged to make these and existing databases containing information on holdings (current and past) accessible through electronic telecommunications or broadcasting systems available on the Information Highway.

As individual organizations move to create automated descriptions, their data can be linked through electronic networks, increasing the speed and breadth of access. The Internet and the developing Information Highway infrastructure will provide significant opportunities for sharing among organizations and users, and will allow repositories and producers to participate in valuable exchanges of data leading to more judicious use of resources dedicated to acquisition, preservation and copying for access purposes.

Survey results indicated that 41% of holdings are controlled using manual finding aids only. 8% of respondents indicated they were unable to provide any form of intellectual control over their holdings.

Currently, a number of disparate mechanisms including database services, published and unpublished inventories, indexes and directories enable users to locate information about holdings in Canada. While compiling entries from different sources to create listings and directories has been the traditional approach to the creation of access tools, a lack of connectivity and consistency in description and database design for information held in electronic formats hinders efforts to integrate information and impedes one-stop access to data on audio-visual holdings. Building on the automated applications currently in use, the Task Force proposes a progressive approach that will allow an assessment of the challenges of operating in these environments before expanding the concept to data from a wider variety of sources. It recommends:

Recommendation 15

That a system of linkages among the various databases be progressively implemented leading to single-window access to descriptions of Canada's audio-visual heritage.

- For this purpose, a pilot project linking a number of stakeholders across Canada should be initiated, with the additional goal of determining the headers and descriptors, source and copyright data and 'birth certificate' data (title, creator, year, etc.) required and the findings communicated to media manufacturers to allow the tracking of such data in the near future.

Moving to a common descriptive practice

The type of information gathered by organizations, the format for description and the presentation varies widely. For example, in industry, descriptive practices may be geared to provide clients with a catalogue of products or retrieval of stock subjects; whereas, in archives description, priorities favour provenance and context for the collection as a whole rather than its individual elements. Among cultural institutions, descriptive practices depend on the needs of particular users and resources available to develop research tools.

There is a viable basis on which to build a common descriptive practice with shared standards for audio-visual holdings. Cooperation and sustained coordination among all participants in the development and implementation of descriptive standards,

For example, FILM/VIDEO CANADIANA and the Union Catalogue provide data about major components of Canada's audio-visual heritage. Increasingly, information is becoming available through on-line services or CD-ROM products.

from the archival community through to the specialized interests of industry and technology, is the key to making description serve all users of the audio-visual heritage. The Task Force recommends:

Recommendation 16

That descriptive standards for audio-visual archives be adopted; that standards be communicated quickly upon acceptance; and that compatibility be stressed among the various systems for standards (such as Anglo-American Cataloguing Rules or Rules for Archival Description) currently used by Canadian institutions.

4.2 Looking to the Future

Technological changes sharpen our focus on the need for solutions to current issues and the need to foresee future problems. Throughout this strategy, the Task Force recommendations strive for a forward-looking approach that builds on existing systems and takes advantage of new developments. In an ever-changing technological environment, today's answers cannot presume to address future needs, but open and adaptable mechanisms can be implemented that will facilitate the preservation and use of Canada's audio-visual heritage.

Current work on development and implementation of Rules for Archival Description (RAD) combined with the existing experience by some institutions with Anglo-American Cataloguing Rules (AACR2) provide a strong foundation for a shared approach to description.

Building on existing mechanisms for the capture of new information

In Canada, there is no comprehensive system designed to serve the needs of users and creators in registering titles and tracking rights holders on a continuing basis. For new Canadian productions, the Register of Copyright maintains a basic registry of published audio-visual productions and rights owners. However, its application for heritage and access purposes is limited. For example, it does not cover broadcasters'

Other countries have implemented voluntary or mandatory systems which have proven advantages for promoting research use and commercial exploitation. The Japanese central rights registry provides an effective example of a system that can link copyright holders and users (see Appendix F).

rights. Instituting a voluntary registry for all types of audio-visual works in Canada would assist efforts to ensure that those components of production deemed to be of heritage value are identified and preserved appropriately. The Task Force recommends:

Recommendation 17

That a voluntary central production registry system for film, video, radio television, and multimedia works be designed linking the existing components such as the Register of Copyright, Union Catalogue, Film/Video Canadiana and Canadian Heritage Information Network, to provide producers, artists, broadcasters, distributors, custodians and users with information needed to facilitate access to the Canadian audio-visual heritage.

To maximize the efficiency of such a registry, all artists, producers, broadcasters and distributors will be urged to participate.

Protecting moral and intellectual property rights

An important factor that imposes conditions on accessibility is the protection of moral, intellectual and economic rights through legislated copyright, ensuring that creators can control the use of their works and recover payment from this use. Industry organizations preserve their audio-visual holdings for the explicit purpose of deriving future benefits. Without this protection, a significant incentive to invest in new production would disappear. On the other hand, users' interests lie in making the audio-visual heritage more accessible, so it can be more readily diffused and reused. The Task Force believes an effective balance between these interests can be achieved.

Whether it rests with public or private organizations, ownership or physical custody does not necessarily confer intellectual rights over these materials. The physical transfer or acquisition of audio-visual materials only confers copyright when there has been a specific agreement to do so. An added complexity is that individual productions may be subject to more than one copyright with separate rights for the audio and visual components. Use may require permission from the different parties. Even where the issue of copyright ownership is clear, it may be difficult to locate the person or body able to provide permission. The lack of an easy method of locating copyright owners and a

Defining whether a work is published or unpublished is a critical factor in determining rights status. For unpublished works, copyright is perpetual. For published works, copyright expires 50 years after the end of the year in which the creator dies. See Appendix F for more details on copyright and audio-visual works.

practical system of applying scaled fees and licensing are major obstacles experienced in Canada to increased use of audio-visual materials. Cultural institutions whose primary mandate is to facilitate access often find themselves unequipped to provide basic rights information about their holdings.

The impact of restricted rights is a major issue for cultural institutions whose mandate is to promote access and enhanced use of the audio-visual heritage. They must balance the appropriateness of allocating scarce resources to material which will remain unavailable to users with the potential loss of this heritage if it is left without proper care. In providing user access, organizations take every care to protect the rights of creators and copyright holders. Therefore, it is usual that reference copies be examined by users on the premises of an organization. However, there is a growing recognition that in time and with technological developments it will be possible to give users access to materials through electronic information networks. Recognizing that such access will require new approaches to ensuring the integrity of the information being provided and the protection of intellectual property rights, the Task Force recommends:

Recommendation 18

That the Departments of Canadian Heritage and Industry Canada, in pursuing current initiatives to simplify and improve the management of rights, take measures for the creation of mechanisms that would both ensure equitable and efficient management of rights (including compensation of rights holders) and facilitate the use of Canada's audio-visual heritage held by public and private institutions.

In the meantime, all stakeholders are encouraged to continue to negotiate with copyright owners on access to their collections and to formalize these relationships in contracts.

Digital technology for an integrated management system

With digital processing, the convergence of the television and computer industries is redefining the way the production industry works by providing needed solutions for instant access and graphic processing speed, unlimited image and sound manipulation, and transparent copying, while at the same time reducing capital equipment and maintenance expenditures. Implementing an integrated system does not require the

Survey results indicated that 63% of all audio-visual holdings are open for use by the public; 26% of respondents offer film loan services; 42% offer video loan services, and 20% offer sound recording loans (see Appendix A).

An integrated management system is a multi-cassette storage device coupled to a bank of digital television recorders by a high-speed robotic arm and controlled by computers linked to the archive catalogue and index system software. The on-line cassette library can be as small as 40 cassettes or as large as several thousand; size is determined by the user application and the availability of capital dollars.

immediate conversion to digital of the complete contents of an archive because they provide a buffer between what has and has not been digitized. It is possible to use the multi-cassette portion of the system with any format of analogue or digital machine to input source documents to the 'near on-line system' that feeds the 'on-line' servers.

New technology system designs and hardware, when introduced, will allow archives to enhance the efficiency of existing operations and access to holdings. There is the possibility of offering the same services to distant locations and archive branches that are now only available to a central archive location. Thus, for the first time, an archival institution can become a 'virtual archive' through the networked sharing of resources and records. To pursue the promising future of digital technology in heritage applications, the Task Force recommends:

Recommendation 19

That a study be undertaken to define the requirements for the conversion to digital technology in the management of audio-visual archives. The study should document user/client requirements for an integrated system, including storage and access, as well as the concept of virtual archives. It should be followed by a study of the level and usage of digital compression to be used for extended term storage of audio-visual material.

The television production and post-production processes are rapidly moving towards the on-line usage of computer-based disc storage systems. These video servers allow simultaneous access to program records by a multitude of users at selectable quality levels.

MEDIALOG was a prototype of a cooperative multimedia service designed for Canadian cultural institutions to provide user access, reproduction capabilities and rights compensation. It was one of the early projects to take advantage of innovative technologies to provide integrated distant access services.

The Jean Talon Project proposed electronic publishing methods to package information from government sources about Canada in the twentieth century for educational markets.

The National Film Board robotic service points demonstrate how users can gain access to materials held in digitized formats along with descriptive information about these materials.

4.3 Establishing Equitable Support for Access and Use

Audio-visual materials will be a critical source of content for the developing Information Highway and a key component of increased economic activity and job creation in cultural sectors. All stakeholders must prepare to service rising public expectations for rapid access to information and holdings and develop cost-effective solutions to delivering services and products. For business organizations, the marketplace and economic viability largely determine response to user requirements. But for cultural institutions, the ability to understand and respond to increasing and changing demands is more complex due to the wide variety of interests to be addressed.
In the audio-visual field, heritage material is increasingly becoming a valuable resource for research, study, analysis and for re-use in film and television productions. The emergence of specialized users, such as the film and television sector, as well as other new users in multi-media production, are currently challenging cultural institutions to enhance tools for access and provide specialized services. While the needs of current users are generally known, organizations must respond to changing needs of future users, particularly with the impact of electronic access. A responsive, service-oriented approach is essential if cultural institutions are to maintain a vital role in cultural production. In keeping with accepted strategies of client involvement, there will be benefits in seeking and considering the advice of users on how institutional practices should be conducted, and this is one of the primary reasons for including user representation in the proposed Consortium.

In promoting enhanced use of the audio-visual heritage, this strategy strives to minimize barriers and to encourage the public benefits that can be derived by individuals and groups who access the wealth of holdings in cultural institutions and business organizations. In addition to the established commercial context in which business organizations operate, the audio-visual community recognizes that it is reasonable for cultural institutions to charge fees for services in order to sustain availability and to respond to specialized needs. Notwithstanding the principle of free access to public cultural holdings, there is growing acceptance that scaled user services

and fees are a practical and equitable means of making the audio-visual heritage available to diverse user groups. Therefore, the Task Force recommends:

Recommendation 20

That stakeholders respect the principle that all Canadians have a right of basic access (consultation) to audio-visual heritage material, while respecting the rights of owners of copyright. It is recognized, however, that institutions may have to establish fees for services and products, on a cost-recovery basis.

CONCLUSION

All those concerned for the well-being of Canada's audio-visual heritage recognize the need for immediate action tailored to the particular environments of audio-visual production, preservation and access in Canada. For the first time, all sectors have come together to examine the situation and to develop a concerted strategy founded on cooperation. The Task Force has presented concrete recommendations that address every operational activity in identifying, preserving and making this great legacy available. Having studied initiatives in other countries, the Task Force has drawn on relevant approaches as well as recognized the unique responses required in this country. The solutions are modest and conceived with acute awareness of the fiscal climate. These recommendations reflect the commitment to shared responsibility for the management of the audio-visual heritage and to responsible resourcing practices — focusing priorities and mandates, consolidating specialized service facilities and integrating preventive measures.

A three-year action plan is proposed for the implementation of these inter-related strategy components — to be launched appropriately in the centennial year of the invention of cinema. The foremost priority is to ESTABLISH THE COMMUNITY INFRASTRUCTURE within the first year. To establish the Consortium of stakeholders, the National Archives of Canada, in cooperation with the Department of Canadian Heritage, should undertake the development of terms of reference within the next six months. In turn, as the Consortium begins its activities, it should focus on the identification of collective priorities and the development of a detailed action plan to implement and promote this strategy. Other activities during the first year of operation should include the preparatory work required to develop funding mechanisms, the identification of requirements for a training and information program, and the initiation of a process to integrate identification and preservation concerns into various federal activities and programs.

In the second year, it is critical that funds be made available, and that the Consortium be

ready to initiate programs based on funding mechanisms. Other activities to be undertaken by the Consortium, in cooperation with the Department of Canadian Heritage and appropriate organizations and bodies include a feasibility study on establishing regional storage facilities, research initiatives, development of standards, initiation of a project leading to single-window access, development of a voluntary central production registry, progress toward the adoption of descriptive standards and a study on the application of digital technology.

The third year of this implementation plan should ensure an ongoing mechanism for audio-visual preservation and administration of the Preservation Fund. In addition, concrete action towards the realization of regional storage facilities and a centre of expertise on obsolete and deteriorating formats should ensue. Implementation of a central production registry, a study on a rights clearance mechanism, implementation of a training and information program and a follow-up study on digital technology and compression are all activities which should take place in 1998/1999.

Linking the past, present and future, the creation and use of audio-visual materials are active components of Canada's cultural and economic production. The contributions of thriving cultural industries are not only seen in terms of financial benefits, but also in terms of expressing and promoting cultural identities. The audio-visual heritage forms a vital source for new creations, as well as being an increasingly vital source for re-use and rebroadcast. As demands for content for the information highway emerge, Canada's audio-visual heritage can be an essential part of that environment if the systems to identify and preserve it are in place. For both cultural and economic reasons, the availability of Canadian content must keep pace with the inevitable advances in communications technology. The information highway promises to be a vital tool for Canadians to access their heritage...but only if that heritage survives to see the day. The Task Force on the Preservation and Enhanced Use of Canada's Audio-Visual Heritage has presented the recommendations that will ensure that survival. It is now up to all stakeholders to ensure that this vision is realized.

RECOMMENDATIONS

Rec. 1
The responsiblity for the preservation of Canada's audio-visual heritage must be borne by a network of STAKEHOLDERS, operating in accordance with clearly defined mandates and jurisdictions to ensure broader protection and compatible access to Canada's audio-visual heritage, and to allow a decentralized approach to the preservation of these cultural resources.

Rec. 2
A Consortium of stakeholders, as a charitable and non-profit corporation, should be established to coordinate the implementation of the national strategy, and to undertake projects and programs with respect to the preservation and enhanced use of the audio-visual heritage.

The responsibility of the Consortium should include:

- Fostering the development of detailed action plans and setting priorities in collaboration with the stakeholders, to implement the national strategy for the preservation and enhanced use of the audio-visual heritage;
- Managing projects and programs related to the preservation and enhanced use of Canada's audio-visual heritage: Such as arrangement, description and cataloguing; copying; storing and maintaining; providing access; training and exchanging information; preparing an inventory of existing equipment, services and expertise;
- Administering funds dedicated to the management of the audio-visual heritage;
- Initiating, facilitating and supporting the identification/selection of the audio-visual heritage; developing standards for effective storage and archival formats, and clarifying rights.
- Establishing and sustaining a modest secretariat to carry out these activities.

Shared responsibility for the preservation of Canada's A-V heritage.

Stakeholders are industry organizations including producers, broadcasters and distributors; cultural institutions such as archives, libraries, documentation centres and museums; various national and regional communities including First Nations, ethno-cultural groups and artists' collectives, as well as related professional associations and funding agencies. "Stakeholders" is intended as an inclusive term for all those who create and collect audio-visual archival holdings, including representation from those who own the rights, use them and support them.

The terms of reference for the Consortium should be developed within the first six months of the implementation of the strategy, under the joint responsibility of the Department of Canadian Heritage and the National Archives of Canada, and in collaboration with Task Force representatives.

Rec. 3

The stakeholders are responsible for identifying the elements that make up Canada's audio-visual heritage on the basis of general selection principles and criteria that reflect the values of Canadian society assessing relevance primarily in terms of Canadian content, Canadian production and material of significance to Canadians.

However, considering their rarity, their archival value and the substantial losses that have already occurred, it is recommended that the following categories of material be given urgent consideration:

- audio-visual recordings (including unedited material) produced before 1940;
- Canadian films and sound recordings produced before 1950;
- television and radio programs produced in Canada before 1960;
- Canadian sound recordings produced and published before 1970;
- Canadian video recordings in non-standard formats produced independently before 1980 and music videos from the same period.

Rec. 4

All stakeholders are responsible for establishing procedures for identifying and selecting the audio-visual elements of enduring value, both from their existing holdings, and from current and future productions.

Among these things, the stakeholders should:

- ensure proper retention of audio-visual material and develop selection criteria and retention schedules with assistance and expertise coordinated by the Consortium; these should be reviewed periodically by the stakeholders.
- allow time for some level of historical perspective, and determine a minimum period of retention for all audio-visual material, where appropriate, before the application of selection criteria.

Identification / selection of the A-V heritage by stakeholders

- allow input from representatives of user groups on selection criteria and intellectual and physical access, and develop consultation mechanisms.

Rec. 5

The following agencies and departments should be urged to establish mechanisms to assist in the proper identification, selection and long-term retention of our audio-visual heritage:

- Canadian Audio-Visual Certification Office of the Department of Canadian Heritage, Telefilm Canada and the Canada Council as well as provincial and municipal funding organizations to ensure that a preservation component (original and/or a master) of audio-visual productions they fund is maintained in recommended storage conditions. ***Where this master is to be manufactured, the cost of the master should be considered as a legitimate production cost in the application for tax credit or protection funding.***

- The Department of Canadian Heritage, in cooperation with the Canadian Association of Broadcasters, to promote the institution of a 'Day in the life of Canadian radio and television.' ***All public and private broadcasters to be encouraged to record (on professional tape and at their expense), to document and to ensure the retention of one full day of programming annually. For the first year, it is suggested that this take place on the Monday of the third week of February _ Heritage Day.***

- With the cooperation of the Consortium, the Bankruptcy Superintendent Office to prepare and diffuse a circular to the trustees under the *Bankruptcy and Insolvency Act* to the effect that audio-visual productions of the bankrupt company or of companies are submitted to a stakeholder of the Consortium for an assessment of the archival value of the material.

- The Department of Canadian Heritage to promote the use of the following standard clause for any cultural federal-provincial agreement referring to Canadian audio-visual material:

  Each party to this agreement must, subject to the *Copyright Act*, and the rights of copyright owners and the rights derived therefrom, enforce the preservation of moving image and sound recordings and other master material associated with multi-media productions, and facilitate access to them through institutions and organizations created for this purpose, such as archives, libraries, film libraries/cinematheques, museums, electronic means of dissemination, networks, etc., as the case may be.

Rec. 6
To support intellectual and physical processing for the long-term preservation of Canada's audio-visual heritage, the federal government should:

For the highest priority materials at risk in the existing holdings

- establish a cost-shared program at a level of two million dollars per year for ten years for non-federal stakeholders, and allocate an equivalent amount of two million dollars per year for ten years to those federal agencies which are already preserving an important part of Canada's audio-visual heritage.

For current and future holdings

- facilitate the creation of a Preservation Fund, generating a minimum of two million dollars per year, to support preservation and/or restoration, and intellectual and physical processing projects. The fund could include contributions (included in production costs and tax deductible, if applicable) from producers, broadcasters, individuals and private organizations (who could also benefit from tax deduction provisions), and contributions from any public organization.

Rec. 7
That, given the critical importance of adequate storage, common regional storage facilities (the limited number and location to be determined by a feasibility study) should be established where necessary.

Rec. 8
That a single centre, operating on a cost-recovery basis, should be established on the premises of the National Archives of Canada to address the problem of obsolete formats and to provide specialized services for the stabilization and the restoration of severely deteriorated and/or damaged film, video and sound archival records.

- To implement the creation of this single service centre for obsolete formats and deteriorated and damaged media, special funding at a level of one million dollars over three years be provided to train staff and equip laboratories.

- This centre may associate, when necessary, with certified public and private centres of expertise (such as the National Film Board of Canada on colour film remastering).

Funding Mechanisms

Common regional storage facilities

Creation of a centre of expertise for obsolete and deteriorated formats

Rec. 9
Stakeholders should integrate preservation management and conservation measures (including preventive conservation) at every point in the record cycle:

- All film originals should be preserved as long as possible. *It is recommended that polyester-based film stocks be used for masters. All film should be stored at recommended low temperature and relative humidity levels and monitored by acid detection technology and periodic colour evaluation for fading and loss of contrast.*

- All magnetic recordings (audio and video) should be stored at recommended temperature and relative humidity levels for extended term storage. *However, because these formats tend to become obsolete very rapidly, these records should be re-recorded onto a digital format to preserve the program content.*

- To provide access and protect master material (obsolete or recent formats), reference copies, which respect the integrity of the original work, should be available for researchers, with secure access to respect the rights of the owners of copyright and those who derive their rights from copyright, and in a manner that avoids competition with commercial sources. *Reference copies may be made on less costly media.*

Rec. 10
Research should be conducted to determine the specifications for a recording medium for extended term storage.

- The requirements for ongoing scientific research into the preservation of audio-visual media, both recent and obsolete, should be quickly defined by the stakeholders, and the Canadian Conservation Institute and the Communications Research Centre are urged to cooperate with public and private, foreign and domestic, research laboratories and manufacturers of digital equipment to develop appropriate research programs.

Rec. 11
Canada, through its representatives in Canadian and international standardization organizations (Canadian General Standard Board, International Organization for Standardization, Society of Motion Picture and Television Engineers and others), should continue to work actively on the development of standards governing the manufacture of durable media and to promote recognition of standards among the stakeholders.

Integration of conservation measures for the management of A-V

Ongoing scientific research and development of standards

Rec. 12
A training and exchange program on the preservation of audio-visual support media, including the organization of and participation in seminars, conferences, hands-on training, publication of advisory information, and other such activities in Canada and abroad, should be set up by the new Consortium.

- The financial requirement for this program, estimated at a level of half a million dollars over five years should be managed by the new Consortium. The funding could be allocated from existing federal programs.

- This program should serve the needs of conservators, technicians, archivists and creators in the various kinds of organizations with archival holdings, both public and private. Post-secondary institutions should also be encouraged to participate in establishing programs in audio-visual engineering and media preservation.

Rec. 13
Without re-examining the general measures being contemplated as part of the Phase II copyright revision, the Task Force recommends that the Departments of Canadian Heritage and Industry Canada include provisions in the Canadian *Copyright Act* to permit the copying of Canada's audio-visual heritage for preservation purposes.

Rec. 14
That all stakeholders prepare and maintain electronic inventories of their holdings; that they be encouraged to make these and existing databases containing information on holdings (current and past) accessible through electronic telecommunications or broadcasting systems available on the Information Highway.

Rec. 15
That a system of linkages among the various databases be progressively implemented leading to single-window access to descriptions of Canada's audio-visual heritage.

- For this purpose, a pilot project linking a number of stakeholders across Canada should be initiated, with the additional goal of determining the headers and descriptors, source and copyright data and 'birth certificate' data (title, creator, year, etc.) required and the findings communicated to media manufacturers to allow the tracking of such data in the near future.

Creation of a training and exchange program

COPYRIGHT ACT and preservation activities

Access to information on A-V heritage through electronic systems

Rec. 16
That descriptive standards for audio-visual archives be adopted; that standards be communicated quickly upon acceptance; that compatibility be stressed among the various systems for standards (such as the Anglo-American Cataloguing Rules or Rules for Archival Description) currently used by Canadian institutions.

Rec. 17
That a voluntary central production registry system for film, video, radio, television and multimedia works be designed linking the existing components such as the Registry of Copyright, Union Catalogue, Film/Video Canadiana and Canadian Heritage Information Network to provide producers, artists, broadcasters, distributors, custodians and users with information needed to facilitate access to the Canadian audio-visual heritage. *To maximize the efficiency of such a registry, all artists, producers, broadcasters and distributors will be urged to participate.*

Rec. 18
That the Departments of Canadian Heritage and Industry Canada, in pursuing current initatives to simplify and improve the management of rights, should take measures for the creation of mechanisms that would both ensure equitable and efficient management of rights (including compensation for the rights holders) and facilitate the use of Canada's audio-visual heritage held by public and private institutions.

In the meantime, all stakeholders are encouraged to continue to negotiate with copyright owners on access to their collections and to formalize these relationships in contracts.

Rec. 19
A study should be undertaken to define the requirements for the conversion to digital technology in the management of audio-visual archives. The study should document user/client requirements for an integrated system, including storage and access, as well as the concept of virtual archives. It should be followed by a study of the level and usage of digital compression to be used for extended term storage of audio-visual material.

Harmonization of descriptive standards

Facilitating access to information about rights

Conversion to and compression of digital formats

Rec. 20
Stakeholders should respect the principle that all Canadians have a right of basic access (consultation) to audio-visual heritage material, while respecting the rights of owners of copyright. It is recognized, however, that institutions may have to establish fees for services and products, on a cost-recovery basis.

Right for basic access and user fees

Annexes of the Report on
Canada's Audio-Visual Heritage
(English version)
For information, access the
"Readme" file

ANNEX A

AUDIO-VISUAL REPOSITORIES IN CANADA

A preliminary survey

Text and project management: Jana Vosikovska
Statistical processing of data: Silmac Inc.

Important note: Opinions expressed herein reflect the views of the author and not necessarily those of the Task Force.

AUDIO-VISUAL REPOSITORIES IN CANADA

A PRELIMINARY SURVEY

In order to gain a general appreciation of the volume of audio-visual collections throughout the country and conditions under which they are kept, the Task Force carried out a survey (the first of its kind in Canada) of such repositories. Unfortunately, the tight timeframe did not allow for a more thorough preparation of the survey (the entire process, including return time for responses, took seven months), nor did it allow for a survey of all identified potential holders of audio-visual collections; instead, a selection had to be made.

I. THE SURVEY METHODOLOGY

Selection of the sample

The survey was designed to elicit information on audio-visual archival holdings from the following general types of organizations:

- **Cultural organizations** (archives, museums, libraries and other cultural organizations)

- **Industry organizations** (film producers, distributors, stockshot libraries, laboratories, television and radio broadcasters and networks).

The names and addresses of the organizations to be surveyed were taken from the following sources:

- *Guide to Oral History Collections in Canada* (Canadian Oral History Association Journal, Vol. 13, 1993);
- *Directory of the Canadian Film, Television and Video Industry 1992* (Telefilm Canada, 1993);
- *Film Canada Yearbook* (Cine-Communications, 1994);
- *Matthews Media Directory* (Matthews, 1994);
- *Le Répertoire National/Directory Assistance* (Shuter-Springhurst Communications Ltd., 1992);
- *The Guide 94* (Canadian Film and Television Production Association, 1994);
- *Film/Video Canadiana, CD-ROM* (National Film Board of Canada, National Library of Canada, National Archives of Canada, La Cinémathèque québécoise; Optim Corporation, 1993);
- *Footage 89 & 91; North American Film and Video Sources* (Prelinger Associates, Inc., 1989, 1991);
- a list of organizations known to the survey managers but not found on the other lists.

Names were not drawn randomly from the above lists. Instead, they were selected with the general goal of ensuring that most of the major or otherwise prominent organizations were included along with a representative cross-section of the smaller ones. Because the lists used in selecting the respondents were not mutually exclusive, care was taken to ensure that organizations were selected no more than once.

For broadcasters, the sample of respondents was selected from the networks as well as from those radio stations that were already in existence in 1955, the cut-off date for television stations was 1965. Large organizations such as the CBC were considered to contain a number of separate archives. Each individual station was viewed as a separate potential respondent.

In general, the sample was designed to include the bulk of the largest and/or most important archives and audio-visual industry organizations in Canada. The responses can therefore be considered as grossly indicative of the situation with the larger and more important organizations and fairly representative of the organizations with medium and small collections. The overall result of this sampling strategy is that though the sample of organizations surveyed is not totally representative of the universe of all audio-visual holdings, it does nevertheless constitute a reasonable preliminary survey of significant audio-visual holdings in Canada. It is important to keep in mind, however, that in the entire Canadian audio-visual universe the amount of audio-visual materials in small and medium size organizations may dwarf the holdings in larger organizations.

Table 1 shows the major lists used in drawing the sample, together with approximate counts of the number of relevant organizations in each list.

Table 1

Counts of Organizations on Major Source Lists

SOURCE LIST	NO. OF ORGANIZATIONS
Telefilm Directory	1,700
Film Canada Yearbook	600
Guide to Oral History (mailing list)	1,000
Matthews Media Directory	700

This gives a total of 4,000 for the organizations on the major lists; however, there is a significant overlap of names on these lists. The number of distinct names on all the lists is approximately 3,600. Some 1,402 organizations were surveyed via questionnaire, with approximately 60% of responses later substantiated by a brief telephone interview.

Response Rates

The basic approach to the use of the survey results has been to report them in terms of percentages of those who responded. Table 2 shows the number of questionnaires sent, broken down into two groups: Cultural Organizations (archives, museums and other) and Industry Organizations. The total of responses received is also included, together with response rates.

Table 2

Number of Questionnaires Sent Out
(By Group of Respondent)

SURVEY GROUP	NUMBER SURVEYED	NUMBER OF RESPONSES	RESPONSE RATE
Cultural Organizations	882	294	33%
Industry Organizations	520	132	25%
TOTAL	1,402	426	30%

Of the 1,402 questionnaires sent out some 426 were completed and returned - a response rate of 30%. The 70% of respondents who did not answer the questionnaire can be divided into those who sent back a refusal (5%), undeliverable questionnaires (5%) and no replies at all (60%). This response rate is typical of non-compulsory surveys of this type. Cultural Organizations have a slightly better response rate than do Industry Organizations. This difference is statistically significant (i.e., it is larger than one would expect to occur by chance if the underlying response rates were actually the same).

The provincial response rates varied from a low of 24% for Quebec to a high of 41% for Saskatchewan (see Table 3 below). This kind of variation is typical of the random fluctuations that occur when small groups of responses, such as we have here, are examined. There is no reason to conclude that the underlying willingness to respond differed from province to province.

Table 3

Response Rate By Province

PROVINCE	NUMBER SENT	NUMBER COMPLETED	RESPONSE RATE
Nfld.	52	14	27%
N.S.	71	27	38%
P.E.I.	21	6	28%
N.B.	37	12	32%
Que.	359	87	24%
Ont.	464	135	29%
Man.	60	22	37%
Sask.	58	24	41%
Alta.	102	34	33%
B.C.	140	54	38%
Yukon	20	5	25%
N.W.T.	18	6	33%
TOTAL	**1,402**	**426**	**30%**

II. THE SURVEY RESULTS

Profile of Respondents

A. Source of funding

Findings

Of 426 respondents, 15% identified themselves as federal organizations, 22% as provincial, 15% as regional or municipal and 48% as private. Table 4 shows the overview of responding institutions by type of funding.

Comments

It should be noted, however, that the private group includes not only private production companies, stockshot libraries, distributors, laboratories and private corporations whose main business is not in the audio-visual sector, but also many associations, historical societies, co-operatives, galleries, etc. who, though private, are nevertheless receiving various degree of financial support from all levels of government.

TABLE 4
Responding Organizations
By Type of Funding

Type of funding	% OF RESPONDENTS
FEDERAL	14.6%
PROVINCIAL	22.1%
REG./MUNICIPAL	14.8%
PRIVATE	48.6%

B. A-V Archives

Findings

The respondents were given the option to identify their activity in film, video or recorded sound as that of an audio-visual archives. Slightly over 25% of cultural and 12% of industry organizations did so. Table 5 shows an overview of respondents in cultural and industry groups with audio-visual archives as opposed to those with audio-visual collections.

TABLE 5
Respondents - Overview
A-V Archives vs A-V Collections

ACTIVITY- GROUP	% OF RESPONDENTS
A-V COLLECTIONS - INDUSTRY	18.5%
A-V COLLECTIONS - CULTURAL	43.7%
A-V ARCHIVES - INDUSTRY	12.4%
A-V ARCHIVES - CULTURAL	25.4%

Comments

Almost 38% of respondents indicated that they are attempting to protect at least a portion of their audio-visual holdings for posterity. It is also important to note that the majority of those who reported very large and large collections (and who hold more than half of all materials in all media) belong to this group.

In the case of cultural organizations, these records are considered to be part of the

overall historical documentation collected (majority are archives, museums, libraries and historical societies), or an important documentation of their artistic, educational, or corporate activities (e.g., in the case of galleries, artists' and film makers' cooperatives and various interest groups and associations). The main purpose of archives within this group is the permanent preservation of their records.

The main reason for the existence of audio-visual archives within the audio-visual industry (often referred to as "production archives") is to protect past production as a valuable asset for future use in new productions or for redistribution, as well as to document corporate activities.

* **Although 12% of industry organizations identified themselves as audio-visual archives, they do not normally provide public access to their holdings. The assumption is that all cultural organizations provide some public access even if limited by their ability to make reference copies.**

C. RESOURCES

C.1 Budget

Findings

The survey revealed that a majority of respondents found it difficult to indicate how much operational money they spend on archiving their audio-visual materials. Cultural organizations with multi-media involvement cost their expenditures by activities (eg., acquisition, description, access, diffusion, maintenance) without further subdivision by individual media, while in industry organizations, the description and maintenance of audio-visual holdings are often not concentrated in a single-purpose unit but rather carried out during the day-to-day operations in various parts of the production, broadcasting, etc. company.

Comments

Despite the fact that the survey did not provide statistically representative data on this topic, it is important to mention that quite a number of respondents indicated during follow-up interviews that their shrinking budgets allow them to devote less and less time to the development, description and preservation of their audio-visual collections. Actually, four respondents (almost 1% of the responding organizations) indicated that they are about to be dismantled or their activities substantially reduced.

C.2 Human resources

Findings

More definite information was, however, received about the human resources devoted to maintaining and servicing audio-visual collections; though the respondents in both groups found it again difficult to indicate the exact staff time spent on this particular activity, the responses were in most cases verified in follow-up interviews and proved to be reasonably accurate. The results (see table 6) show quite decisively that the respondents from the "industry" group devote more human resources to looking after their audio-visual assets.

The results received from the "cultural" group indicate lesser staff involvement in audio-visual work and reflect clearly the fact that respondents are often involved in multi-media collecting activities (general archives, museums, libraries) or that their audio-visual collections are only a by-product or a result of one or several functions of that particular organization (gallery, educational institution, interest group, etc.).

Table 6

Human Resources in A-V (average staff)
Overview by Type of Organization

	A-V Arch.-Cult.	A-V Arch.-Indus.	A-V Coll.-Cult.	A-V Coll.-Indus.	Total
No. of Organizations	**108.00**	**53.00**	**186.00**	**79.00**	**426.00**
Professional - archivist	55.38	80.01	41.80	26.25	203.44
Professional - technical	43.92	18.00	35.90	66.75	164.57
Other	33.88	30.01	28.60	28.60	121.09
TOTAL STAFF	133.18	128.02	114.22	121.60	496.82
AVERAGE STAFF	1.23	2.42	0.61	1.54	1.17

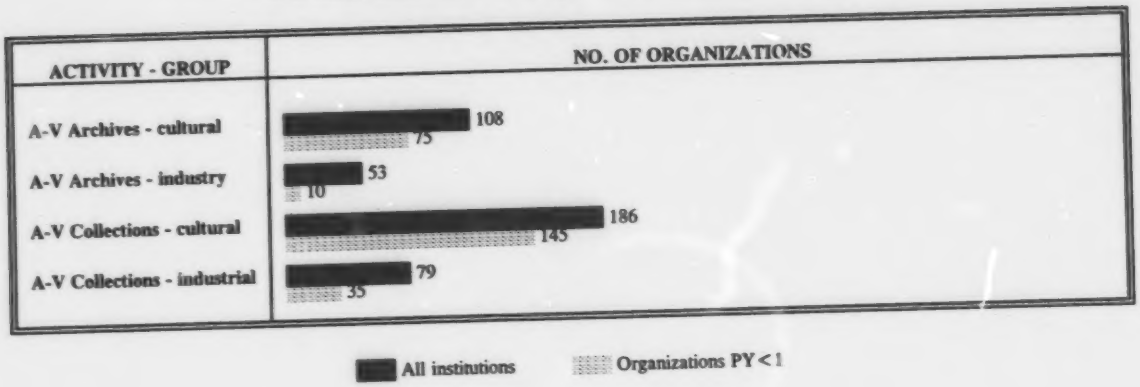
A-V Arch.- Cult. = cultural organizations identified as having A-V archives
A-V Collections - Cult. = cultural organizations with A-V materials

A-V Arch.- Indus. = production archives
A-V Collections- Indus . = industry organizations with A-V materials

Table 7 shows the volume of organizations with less than 1 person (PY < 1) devoted to audio-visual collections. Organizations with audio-visual archives have a higher number of professional archival staff (archivists, librarians), while professional technical staff are better represented within the industry group.

Table 7

Human Resources in A-V
All Organizations vs Organizations with PY <1



Comments

Broadcasters, for example, have to spend considerable time on a detailed description of their newscast and actuality materials; otherwise they would not be able to retrieve promptly the elements required for present or future broadcasts. To a certain degree, this also applies to other companies involved in the production or distribution of audio-visual products.

The staff responsibilities in many cultural organizations with audio-visual archives include work with several media, as well as "non-archival" activities such as publication, education, exhibition, etc. This is especially true in the case of smaller organizations with limited resources, where a single person is a librarian, an archivist, a technician, even a fund raiser and an administrator, and handles all types of media and materials held by that organization.

D. Holdings

D.1 Characterization and volume of holdings

See Tables 8, 9. 10, 11 for statistical information

Findings

Reported holdings cover a wide range of subjects, forms, formats and genres in all three media. They range from rich, multi-media collections of public and private records held by larger organizations (such as national cultural organizations, provincial archives and institutions, crown corporations, universities, private production/distribution/releasing corporations, etc.) to

modest, often monothematic collections of smaller organizations (such as historical societies, cooperatives, local/regional government archives). The majority of holdings (87%) consist of Canadian material, and as such these oral and visual records of prominent personalities and ordinary citizens, of memorable events and local day-to-day life represent a true audio-visual memory of this nation.

The total volume of reported holdings as given in Tables 8, 9 and 10 is 4,008,030 hours. It has to be understood, however, that these figures are estimates, because the responding organizations were unable to provide the exact size of their audio-visual holdings.

Comments

The main reason for this difficulty in establishing quantity is that, without the physical examination and measurement of each unit of audio-visual material, it is not possible to know its size in feet, metres or hours. One can of film may, for example, hold anywhere from a few to several hundred feet, one audio or videotape can hold a few seconds or several hours of material, all depending on the dimensions and size of the carriers and on the recording speed.

* **The percentage of the four million hours reported as holdings that will be identified as the Canadian audio-visual heritage cannot be estimated with precision at this time. The holdings contain substantial quantities of duplicates, foreign material and production related resources (out-takes, tests, etc.). However, it is estimated that 10% are in a category of extremely high value, namely, treasures.**

* **What is not clear, of course, is the relation of the known holdings to the total universe of production in the past 100 years. We know, for example, some of the specifics of the loss rate in feature films or CBC Network programming, but we do not know the extent of the losses in the audio-visual heritage as a whole.**

Table 8

Total Hours of Material Held by Respondent
FILM

PROVINCES	SIZE OF HOLDINGS				Total
	Small	Medium	Large	V. Large	
Newfoundland	100	7,510			7,610
Nova Scotia	1,400	2,500	7,500		11,400
P.E.I.	60	2,500			2,560
New Brunswick	1,050	7,500			8,550
Quebec	6,710	22,510	37,600	205,000	271,820
Ontario	8,700	32,500	60,000	288,000	389,200
Manitoba	870	2,510	60,000		63,380
Saskatchewan	550	5,000			5,550
Alberta	2,230	7,520			9,750
British Columbia	1,500	2,510	30,000		34,060
Yukon	250				250
N.W.T.	250				250
TOTAL	23,720	92,560	195,100	493,000	804,380

Average Hours of Material Per Respondents
FILM

PROVINCES	SIZE OF HOLDINGS			
	Small	Medium	Large	V. Large
Newfoundland	50	2,503		
Nova Scotia	175	2,500	7,500	
Prince Edward Island	60	2,500		
New Brunswick	263	2,500		
Quebec	153	2,501	18,800	102,500
Ontario	136	2,500	12,000	96,000
Manitoba	109	2,510	30,000	
Saskatchewan	50	2,500		
Alberta	159	2,507		
British Columbia	62	2,510	30,000	
Yukon	125			
N.W.T.	125			
TOTAL	128	2,502	17,736	98,600

Table 9

Total Hours of Material Held by Respondents
VIDEO

PROVINCES	SIZE OF HOLDINGS				Total
	Small	Medium	Large	V. Large	
Newfoundland	1,400	5,000			6,400
Nova Scotia	4,400	10,000			14,400
P.E.I.	100	2,500			2,600
New Brunswick	250	5,000	7,500		12,750
Quebec	11,150	27,500	195,000	335,000	568,650
Ontario	18,950	45,000	157,500	440,000	661,450
Manitoba	2,050	5,000	7,500		14,550
Saskatchewan	2,250	5,000	22,500	130,000	159,750
Alberta	4,800	10,000	30,000		44,800
British Columbia	3,950	5,000	45,000		53,950
Yukon	250	2,500			2,750
N.W.T.	2,350				2,350
TOTAL	51,900	122,500	465,000	905,000	1,544,400

Average Hours of Material Per Respondents
VIDEO

PROVINCES	SIZE OF HOLDINGS			
	Small	Medium	Large	Very Large
Newfoundland	175	2,500		
Nova Scotia	259	2,500		
P.E.I.	50	2,500		
New Brunswick	50	2,500	7,500	
Quebec	210	2,500	17,727	111,667
Ontario	228	2,500	17,500	110,000
Manitoba	171	2,500	7,500	
Saskatchewan	173	2,500	7,500	130,000
Alberta	200	2,500	30,000	
British Columbia	104	2,500	15,000	
Yukon	125	2,500		
N.W.T.	470			
TOTAL	198	2,502	16,034	113,125

Table 10

Total Hours of Material Held by Respondents
AUDIO

PROVINCES	*SIZE OF HOLDINGS*				Total
	Small	*Medium*	*Large*	*V. Large*	
Newfoundland	3,550	10,000	30,000		43,550
Nova Scotia	4,450	2,500	45,000		51,950
P.E.I.	1,600	2,500	7,500		11,600
New Brunswick	3,000	2,500	37,500		43,000
Quebec	9,750	27,500	225,000	335,000	597,250
Ontario	17,950	17,500	30,000	635,000	700,450
Manitoba	5,450	7,500	22,500		35,450
Saskatchewan	1,550	10,000	7,500		19,050
Alberta	4,800	10,000	7,500		22,300
British Columbia	7,100	10,000	75,000		92,100
Yukon	1,000	2,500			3,500
N.W.T.	1,550		37,500		39,050
TOTAL	**61,750**	**102,500**	**525,000**	**970,000**	**1,659,250**

Average Hours of Material Per Respondents
AUDIO

PROVINCES	*SIZE OF HOLDINGS*			
	Small	*Medium*	*Large*	*Very Large*
Newfoundland	394	2,500	30,000	
Nova Scotia	223	2,500	15,000	
P.E.I.	400	2,500	7,500	
New Brunswick	333	2,500	18,750	
Quebec	199	2,500	25,000	111,667
Ontario	211	2,500	7,500	90,714
Manitoba	419	2,500	7,500	
Saskatchewan	111	2,500	7,500	
Alberta	253	2,500	7,500	
British Columbia	203	2,500	18,750	
Yukon	333	2,500		
N.W.T.	517		18,750	
TOTAL	**235**	**2,500**	**16,935**	**97,000**

Table 11

Number of Organizations By Media, Size of Holdings and Province

	FILM					VIDEO					AUDIO				
	Small	Med.	Lrg.	V.Lrg.	Total	Small	Med.	Lrg.	V.Lrg	Total	Small	Med.	Lrg.	V.Lrg	Total
Nfld.	2	3			5	8	2			10	9	4	1		14
N.S.	8	1	1		10	17	4			21	20	1	3		24
P.E.I.	1	1			2	2	1			3	4	1	1		6
N.B.	4	3			7	5	2	1		8	9	1	2		12
Que.	44	9	2	2	57	53	11	11	3	78	49	11	9	3	72
Ont.	64	13	5	3	85	83	18	9	4	114	85	7	4	7	103
Man.	8	1	2		11	12	2	1		15	13	3	3		19
Sask.	11	2			13	13	2	3	1	19	14	4	1		19
Alta.	14	3			17	24	4	1		29	19	4	1		24
B.C.	25	1	1		27	38	2	3		43	35	4	4		43
Yukon	2				2	2	1			3	3	1			4
N.W.T.	2				2	5				5	3		2		5
TOTAL	185	37	11	5	238	262	49	29	8	348	263	41	31	10	345

D.2 Media distribution

Findings

Of the 426 respondents, 46% indicated that they hold all three media (film, video and audio records), 17% hold video and sound, 8% hold film and video, only 1% hold film and sound; and 16% hold sound, 11% video and 1% film alone (see Table 12). All three media tend to be more commonly represented in repository-type organizations (archives, museums, libraries); one- or two-media collections are held mostly by production companies, broadcasters and some media specialized organizations such as artists' cooperatives (e.g., video art), cinematheques or community service oriented organizations (e.g., interpretative or educational/training centres, interest groups), and by repository-type organizations dedicated to collecting mainly one type of historical documents, usually oral history.

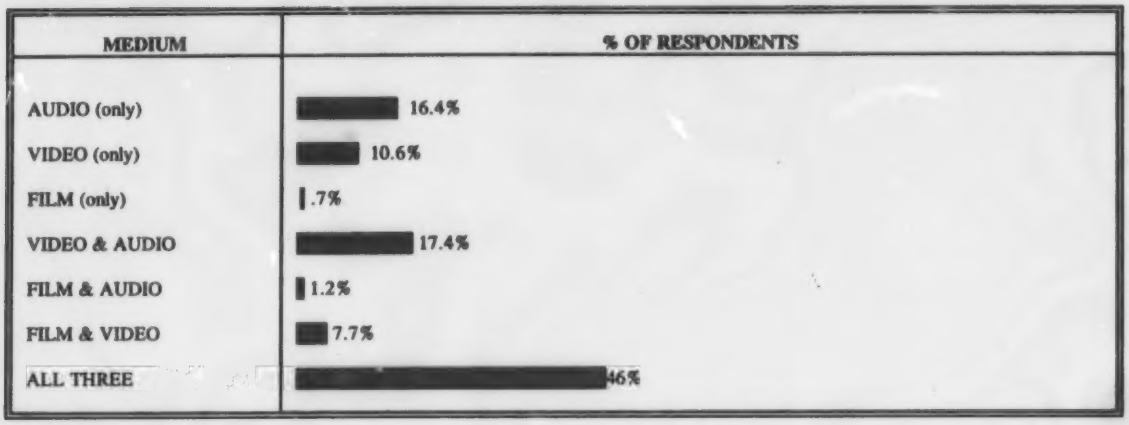
Sound (41%) and video (39%) represent more than three quarters of all reported audio-visual holdings; film is a distant third with a total of 20%.

About 58% of all sound and video and 61% of all film materials are held by relatively few (film - 5, video - 8, sound - 10) organizations, often holding all three media (such as the National Film Board of Canada, the National Archives of Canada, the Canadian Broadcasting Corporation, Alliance Communications -

see tables 8 to 10). Of these, only half are archival institutions involved in permanent preservation, the rest are production archives.

Table 12

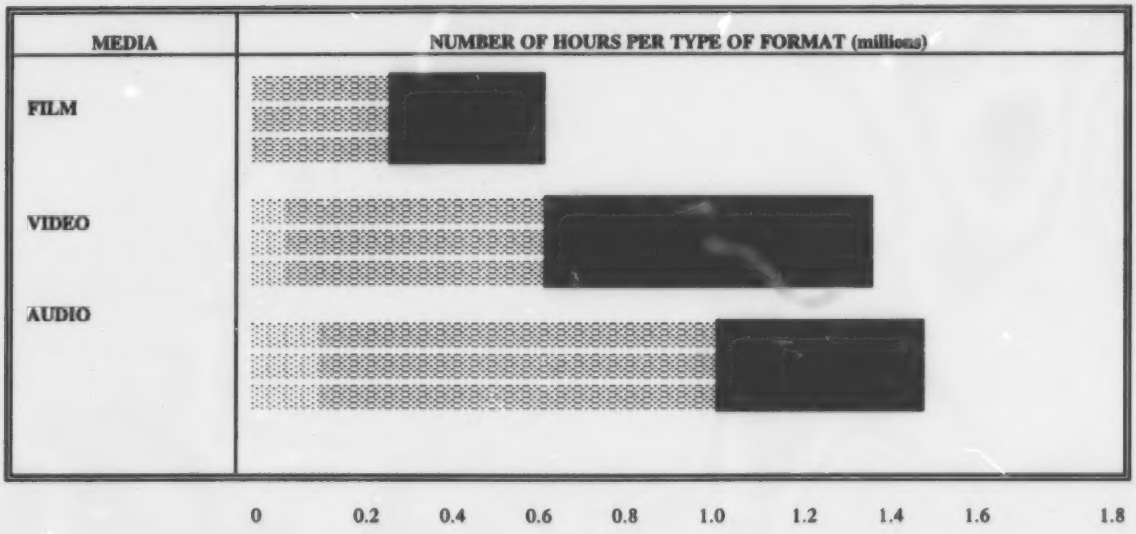
Overview of Holdings (all three media)
Media Distribution Between Respondents



D.3 Uniqueness of holdings

See Table 13 for the overview

Table 13
Overview of Holdings (in all media)
Type of format & Media



Obsolete Originals Copies

D.3.1 Originals

Findings

Originals (such as camera masters, sound tracks, duplicating masters, original audio or video recordings, field footage, out-takes) or copies deemed to be the only known example of a production represent a fair portion of holdings in each media. In film it is 44%, in video 48% and in sound 66%.

Comments

Though some selection may still be justified, this would be the main bulk of documents requiring "archival" attention (i.e., description, special storage, preservation and restoration).

D.3.2 Obsolete formats

Findings

Though they are no longer used in production, distribution or broadcasting there are still quite a number of obsolete formats (see endnote #1) in many collections. Their volume is not startling (roughly 1.5% of all film, 6.5% of all video and 12% of all sound holdings), but their variety and rarity certainly present their holders with a serious preservation problem.

Comments

The age of materials on obsolete formats, their instability (e.g., nitrate film) and fragility (e.g. audio discs) of the carriers, the fact that most of them are the only existing copies left of a work, and the fact that the equipment needed for their viewing/auditioning and reproduction is quickly disappearing, places them into the same category as originals and gives them the status of a top preservation priority.

D.3.3 Copies

Findings

Copies represent a large category in all three media: 54.5% of all film, 41.5% of all video and 22% of all sound holdings.

Comments

A portion of this amount are copies of originals held by respondents, but the fact that many respondents are organizations (libraries, distributors) which can

and do provide copies of their materials to others suggests that one should expect a fairly high volume of duplication in this category. Practically, a number of copies of the same production may be held by any distribution or library-like organization, as well as by any archives or museum.

E. Preservation

Continuous copying and appropriate storage are two essential prerequisites of an effective preservation of audio-visual materials. The survey showed that these two elements are also a main concern of the majority (63%) of those organizations that chose to answer this question (300 of 426) (see endnote #2).

E.1 Copying facilities

Because of physical deterioration, fragility of carriers and rapid technological changes in audio-visual industry, copying and recopying of audio-visual materials is one of the best methods of prolonging their life and saving them for the future.

Findings

The survey addressed this issue by inquiring about copying facilities held by respondents. In film, only 22% organizations reported that they have film copying facilities, in video 50%, and in sound 64%. The most frequent copying equipment is for 16mm and, to a lesser degree, 35mm film (with a very low incidence of obsolete film equipment); for 1/2" and 3/4" video cassettes (the video industry shows a higher rate of digital equipment); and for audio cassettes and 1/4" reel to reel audio recordings (almost 10% of respondents with audio holdings can copy audiodiscs and there is a notable trend towards digital formats – about 25% of respondents reported them, especially in the industry group).

Comments

Copying equipment, especially for film, is rare in small archives. Some respondents (17% of total) have special conservation arrangements with outside organizations (mostly with the National Archives of Canada, La Cinémathèque québécoise, Les Archives nationales du Québec and some provincial archives).

* **The ability to copy film, video or sound does not necessarily mean that the respondents can re-record to a format that can be considered archival. Copying a 1/2" cassette to another 1/2" cassette, for example, is not preservation copying as 1/2" cassettes are not considered an archival format. This report stresses the critical role digital re-recording of all magnetic media (video and sound) will play in the extended term survival of all holdings, the very few audio-visual archives, industry and cultural, are now equipped to meet this challenge.**

E.2 Storage

See table 14 for overview.

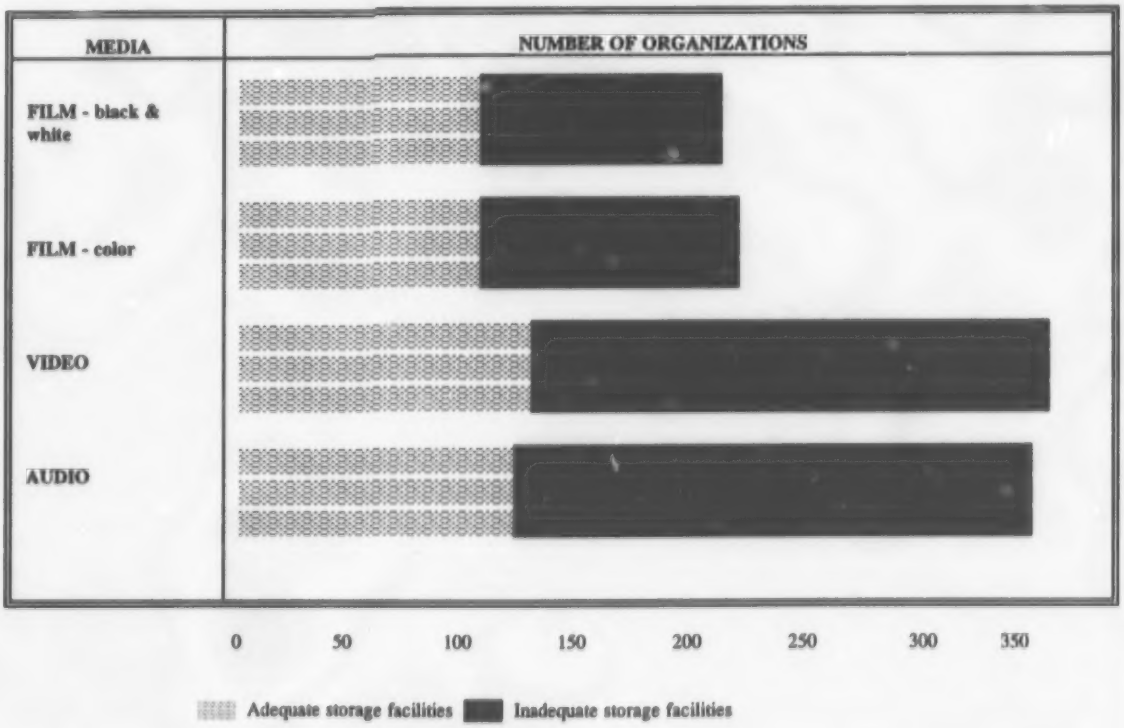
E.2.1 Adequate storage

Findings

Slightly over two fifths of respondents indicated that at least a portion of their holdings is kept in temperature and relative humidity controlled storage.

* **There are only four archives with cold storage facilities which are essential for the long-term storage of all colour film. The National Archives, Les Archives nationales du Québec, La Cinémathèque québécoise and the CBC Toronto have cold storage vaults for colour film, with temperature of 5 degrees Celsius or less and relative humidity of 35% or lower.**

TABLE 14
OVERVIEW OF STORAGE FACILITIES
BY MEDIA HOLDINGS AND ORGANIZATIONS



Comments

Follow-up interviews established that most of these organizations strive to maintain the temperature not higher than 18 degrees C and relative humidity not exceeding 50% (see endnote #3), about 8% arrange for this type of storage with outside organizations (either with some better equipped archives such as the National Archives of Canada, Les Archives nationales du Québec and La Cinémathèque québécoise or with commercial companies specialized in archival storage, such as Bonded Services in Toronto or Archivex in Montreal), while some 10% admitted fluctuation to higher temperatures and relative humidity (fitted to human requirements).

* **Very few respondents meet currently recommended standards for a long-term storage of black-and-white film and magnetic tape in terms of relative humidity (below 40%).**

E.2.2 Inadequate storage

Findings

The remainder of collections (nearly 60% of the total) is kept either in an airconditioned environment (guided in most cases by parameters suitable to human comfort, and thus corresponding to usual conditions found in environmentally controlled offices and production facilities), or in general storage areas, heated or unheated. This does not provide an adequate storage environment for a long-term preservation of fragile media such as audio-visual materials.

Comments

Unfortunately, the latter type of this inadequate storage (heated/unheated space) was reported by 17% of respondents who hold black-and-white film, 14% with colour film, 10% with nitrate film, 21% with video, and 23% with audio holdings. While a majority are smaller organizations which lack sufficient means to adequately care for their collections of priceless local footage and recordings, the survey found in this group a surprisingly high number of fairly large collections (average 16,000 hours per collection), especially in video (five collections) and sound (eight collections).

F. Access to Holdings

F.1 Open vs limited use

Findings

63% of all the audio-visual archives are open to the public (88% within the "cultural" group, 13% within the "industry") and so is half of the other collections (libraries, historical societies, etc.).

Loan or rental services are provided by 26% of all organizations with film, 42% with video and 26% with sound holdings (mainly libraries and distributors). Copies are provided by 33%of film, 55% of video and 51% of sound repositories (mainly broadcasters, stockshot libraries and archives).

Comments

Audio-visual "cultural" archives with limited access include organizations that lack sufficient funding for providing safe open access services or which operate on a seasonal basis only. The principal users of "open" audio-visual collections are the general public and scholars, while audio-visual collections with "limited access" provide services mainly to their parent organizations (e.g., universities, broadcasters).

F.2 Access tools

The main prerequisites for accessibility to any collection of audio-visual material are description of holdings, availability of playback equipment, and documentation (usually textual) which places individual items or parts of collection into an appropriate historical perspective and provides the acquisition history of the collection.

F.2.1 Description

See table 15 for overview.

Findings

Of all respondents, 25% have a combination of manual and computer finding aids (catalogues and registers, approximately 10% at the item level), 26% control their holdings via computer (approximately 20% at item level), 41% have manual catalogues only (cards or registers, approximately 10% at item level) and 8% have no intellectual control of their holdings at all. It can therefore be deducted that about 40% of all audio-visual holdings are at least retrievable by title and that some of this information (up to a maximum of 30%) can be shared to some extent electronically (the cataloguing of audio-visual records is not yet

standardized) among several holders of audio-visual records (probably on diskette copies or via CD-ROM).

The remaining 70% of holdings controlled only through manual finding aids (which are very costly to computerize) or not at all pose a major problem for the sharing of information and particularly for reducing the duplication of preservation efforts.

Comments

Because audio-visual materials can be accessed only through the use of technical equipment it is very laborious to retrieve them without at least minimal indication of the content of a container. For this reason, access to records described only at a general (i.e., collection) level is difficult and in and in some cases impossible. Without some content indication (usually at least by title) it is also impossible to identify multiple copies, duplicates of the same work within one repository or between several different organizations (for example a library, an archives, a distributor, a stockshot library, a producer and a broadcaster: all can have a copy of the same work and all may try to preserve it - and often do).

TABLE 15

Finding aids - Overview

TYPE OF FINDING AIDS	*% OF ORGANIZATIONS WITH FINDING AIDS*
COMPUTER	*26.3%*
MANUAL	*40.6%*
MANUAL & COMPUTER	*24.6%*
NONE	*8.5%*

F.2.2 *Playback facilities*

Findings

48% of audio-visual repositories with film holdings do not have any film playback equipment and can show their holdings only if copied (by outside facilities) onto video format. The situation is much better in video and sound where only 21% of video and 18% of sound holders lack playback facilities.

In addition, about 14% of respondents enhance access to their holdings through special arrangements with some larger organizations which can provide good services and have a large clientele (such as the National Archives of Canada, La Cinémathèque québécoise, Les Archives nationales du Québec and some provincial archives).

F.2.3 Documentation

Findings

80% of respondents keep at least some documentation, mostly textual and photographic (stills), in order to enhance access and appreciation of their audio-visual holdings. Table 16 shows distribution of individual types of documentation between respondents.

TABLE 16

Related documentation kept by organizations

TYPE	% OF ORGANIZATIONS KEEPING RELATED DOCUMENTATION
STILLS	5.2%
POSTERS	1.2%
TEXTUAL	24.2%
STILLS & POSTERS	1.6%
STILLS & TEXTUAL	18.1%
POSTERS & TEXTUAL	3.3%
ALL THREE	24.9%
NONE	21.6%

Comments

Audio-visual records are produced for mass consumption (i.e., for distribution or broadcast) and their historical value cannot be properly evaluated without knowing why and under what circumstances they were created and what impact they had on the society that produced them (e.g. how widely they were distributed, how they were received, how they treated controversial issues). This information is crucial for proper evaluation of the material during archival selection, for its description, for defining the original shape of a work during restoration, and for historical research and study where it helps to understand how society influenced the creation of a work and how society was in turn influenced by the work. Collected documentation also helps to trace the provenance of a collection or its parts and to record its administrative history.

III. Conclusions

- Over half of the surveyed organizations are run by public funds (federal, provincial, regional or municipal); in addition, various grants and other types of public funding are also available to a number of private organizations.

- 38% of respondents identified themselves as audio-visual archives. Over 50% of all materials in each media is held by them. One third of these archives are, however, production archives whose main purpose is to support business activities of parent company, not long-term preservation.

- Almost half of all reported audio-visual collections contain all three media (i.e. film, video and sound).

- Sound recordings are the most common type of holdings (41%), video is second (39%) and film is a distant third (20%).

- Close to 60% of all identified holdings are held by 12 organizations (five among them are either cultural (2) or production (3) audio-visual archives.

- Cultural organizations spent less staff time looking after their audio-visual collections than the "industry" organizations: almost three quarters of cultural organizations with audio-visual archives or audio-visual collections devote less than 1 person-year to the maintenance, description and servicing of their audio-visual holdings.

- The estimated volume of all reported holdings in all three media is 4,008,030 hours. More than half of this volume consists of original and unique materials. The majority of these documents are of Canadian origin. It is necessary to understand that this total reflects only the result of the survey, i.e., holdings reported by 426 respondents. The total number of potential holders of audio-visual collections is estimated at 3600. Part B of this annex shows estimates for the total holding of this Canadian audio-visual universe.

- More than half of audio-visual materials are stored in conditions that are detrimental to their preservation. The situation is particularly unsatisfactory in the case of colour film.

- Almost 50% of organizations with film collections have no playback facilities and 80% have no copying facilities. The access to video and sound collections is supported by existence of playback facilities in roughly 80% and copying equipment in more than 50% of reporting organizations.

- Two thirds of responding organizations with the audio-visual archives are open to the public.

- A large portion of the audio-visual holdings is not under the sufficient intellectual control. This makes difficult an efficient sharing of information and hampers the prevention of duplication efforts.

- Four fifths of respondents keep supporting documentation to enhance access to and appreciation of their audio-visual holdings.

- The presented survey of audio-visual holdings is first of its kind ever made in Canada. If the preservation of audio-visual heritage is to be coordinated throughout the country, there is a need for continuous surveying of the status of audio-visual collections in Canada and for development of a mechanism for monitoring the preservation of Canadian audio-visual heritage.

Endnotes:

1. For the purpose of this survey, the respondents were asked to report the following obsolete materials: **film** – 28mm, 17.5mm, 8mm, Super 8mm, 35mm nitrate; **video** – 2" quadruplex, 2" helical, 1/2" open reel; **sound** – audio discs, wax cylinders, belts, wire recordings.

2. Among other issues rated by respondents were **linking/sharing information** (ranked third), **development of selection criteria** (ranked fourth), **establishing preservation standards** (ranked fifth), **standardization of description** (ranked sixth).

3. While these conditions would produce reasonably satisfactory results for most videos, sound and black-and-white film, they will cause a measurable dye fading in merely five years in the case of colour film.

ANNEX A
PART B

AUDIO-VISUAL SURVEY 1995
AND EXTRAPOLATION

AUDIO-VISUAL SURVEY 1995 - EXTRAPOLATION OF RESULTS
An informal estimate (in hours)

Table 1
TOTAL HOLDINGS

	Medium Total % (survey)	Survey*	Extrapolation**	Medium Total*** % (extrapol.)
FILM				
very large	61	493,000	690,200	37
large	24	195,100	266,045	14
small & medium	15	116,280	930,240	49
TOTAL	100	804,380	1,886,485	100
VIDEO				
very large	59	905,000	1,131,250	36
large	30	465,000	609,310	19
small & medium	11	174,400	1,395,200	44
TOTAL	1[illegible]0	1,544,400	3,135,760	100
AUDIO				
very large	58	970,000	1,261,000	39
large	32	525,000	94,355	21
small & medium	10	164,250	1,314,000	40
TOTAL	100	1,659,250	3,269,355	100
GRAND TOTAL		4,008,030	8,291,600	

* The survey includes data provided by selected archives, museums and other cultural institutions, as well as audio-visual producers, distributors, stockshot libraries, laboratories, TV or radio stations and networks.

** The sample was designed to include the bulk of the largest audio-visual collections. Thus the extrapolation is based on calculated ratio of known and unknown number of Very Large and Large collections, while for Small and Medium collections the extrapolation was based on the ratio of received responses and the estimated total of potential holders of audio-visual collections.

*** Because the Survey aimed at capturing the majority of data on Very Large and Large collections, it is assumed that the major portion of their holdings is represented in the Survey results. The Extrapolated data for Small and Medium size collections (based on the ratio of the sample and the calculated "total" universe of audio-visual collections) shows a considerable increase in volume of holdings for these two categories.

AUDIO-VISUAL SURVEY 1995 - EXTRAPOLATION OF RESULTS
An informal estimate (in hours)

Table 2
ORIGINALS* AND OBSOLETE FORMATS**

ORIGINALS

	Medium Total %	*Survey*	*Extrapolation~*
FILM	44	353,429	830,054
VIDEO	48	737,665	1,505,165
SOUND	66	1,094,292	2,157,774

OBSOLETE FORMATS

FILM	1.5	11,773	28,297
VIDEO	6.5	99,971	203,824
SOUND	12.1	200,311	395,592

---

* Original materials include camera masters, duplication masters, original recordings, field footage and out-takes, as well as copies deemed to be rare or unique.

** Obsolete formats include: Film - 28mm, 17.5mm, 8mm, Super 8mm, 35mm nitrate; Video - 2" quadruplex, 2" helical, 1/2" reel; Sound - audio discs, wax cylinders, belts, wire recordings.

~ Based on Survey results (percentage relates the volume of Originals or Obsolete holdings as indicated by respondents to the total of identified holdings for each medium).

AUDIO-VISUAL SURVEY 1995 - EXTRAPOLATION OF RESULTS
An informal estimate (in hours)

COPYING OF ORIGINAL AND OBSOLETE MATERIALS - ESTIMATES

Table 3.1
ORIGINALS and OBSOLETE FORMATS (overview)

	*Extrapol. Total** (100%)	*Copied*** (20%)	*Arch. Value**** (40%)	*Non Arch. Value* (40%)
FILM	858,351	171,670	343,340	343,340
VIDEO	1,708,989	341,798	83,596	683,596
SOUND	2,553,366	510,673	1,021,346	1,021,346

---

* Total of Extrapolated volume of Originals and Obsolete formats (from Table 2).

** Assumed volume (20% of Extrapolated Total) of already copied/protected materials.

*** Materials of Archival Value, i.e. historically significant (see also Table 3.2 below).

Table 3.2
ARCHIVAL VALUE MATERIALS - IMPERATIVE COPYING

	Archival Value	*Treasures**
FILM	343,340	34,334
VIDEO	683,596	68,360
SOUND	1,021,346	102,135

---

* It is assumed that 10% of materials identified as being of Archival Value consist of Treasures and historically significant materials that are damaged. These should be copied as soon as possible. The remainder of Archival Value Materials are historically significant records in good physical condition. In a controlled storage environment (up to archival standards) their lifetime can be considerably extended.

ANNEX B

SELECTION FACTORS FOR AUDIO-VISUAL ARCHIVES

By Greg Eamon
and
Rosemary Bergeron

Important note: Opinions expressed herein reflect the views of the authors and not necessarily those of the Task Force.

ANNEX B

Selection Factors for Audio-Visual Archives

Introduction

The necessity for selecting audio-visual materials begins with the practical reality that everything cannot be kept. The proliferation of audio-visual materials in this country and the limited resources available for preservation make it impossible to retain a copy of every film, videotape or sound recording produced in Canada. Neither would Canadians want to preserve everything. Like individual memory, a nation's collective memory demands selection. The job of archivists is to ensure that the selection process is guided by factors which will enable us to preserve both a representative record and a significant one.

This document presents an overview of the factors involved in selecting audio-visual materials for permanent retention. Knowing the broad criteria by which selection decisions are made can benefit both organizations which collect audio-visual works (exclusively or part of multi-media fonds) - archives, museums, libraries and cinematheques - as well as organizations which create, broadcast, produce or distribute audio-visual works. Naturally, the specific application of the criteria will be unique to each institution.

Selection

Selection involves a variety of different but important considerations, based largely on pertinence. Every corporation, institution, co-operative or individual creator makes a decision to select at some point in time. What is to be kept and what is to be thrown away? Is the material to be kept at the lab or stored in the basement? Is the space used to store old productions or used as a new editing suite? Answering any of these questions constitutes a form of selection. However, a selection based upon the short-term problems of storage space will not lead to an adequate preservation of the audio-visual heritage.

Selection criteria are useful as checklists of factors to consider before the acquisition or rejection of individual sound and moving image documents or groups of documents. The weight given to one factor versus another will change from organization to organization, but as a general rule, the more factors found to be applicable to the documents, the more justifiable the acquisition. To be useful, selection criteria should be considered as tools for the evaluation of groups of audio-visual documents, not just individual items.

The value in applying a set of shared selection criteria is that it facilitates understanding of what different organizations collect and can also help redirect unwanted records to other institutions. It is relatively easy to use selection criteria to justify the acquisition and retention of documents. What is more difficult is deciding when to reject documents, but this might be made easier if an alternative repository can be found.

It is more important to demonstrate the linkages between some of the different selection factors

rather than trying to rank these factors in order of importance. Apart from pertinence, which is a primary consideration, the factors are not listed here in order of importance.

Pertinence

The most important consideration in determining whether sound and moving image documents have enduring value is the relevance or "pertinence" of the documents to the collecting organization or archives.

Pertinence is the term used by the Cultural Properties Export Review Board in the Guidelines for Outstanding Significance and Importance (1994) which were developed to assist institutions to prepare statements for applications for certification for income tax purposes. These guidelines provide archives and other organizations with a means to assess the relevance of a document or documents to the acquisition mandate of the institution and to other documents in the collection.

The concept of pertinence embraces two ideas: the mandate of an organization and its corporate interest. The use of the term "pertinence" may get around the implied distinction between mandate, which has a legal connotation, and corporate interest, which has a financial one. Mandates are often associated with public institutions while corporate interest is more commonly attributed to a private sector company, but the meanings are similar.

Pertinence is a somewhat elastic concept, changing from institution to institution, so a country-wide set of selection criteria can address the concept of pertinence in only the most general of terms. The other criteria always should be considered in relation to pertinence, since it is not the intention of the criteria to favour one kind of audio-visual document over another, for example, non-fiction over fiction.

The Guidelines for Outstanding Significance and Importance provide a means of evaluating sound and moving image documents in the context of other such documents held in the institution and presumably in other institutions. The Guidelines are geared to organizations which collect documents made by others rather than created by themselves, but they are useful in that they focus on the light the documents shed on the person or organization responsible for their creation. Some holdings may document the function or activity of an individual, association or corporation. Others may be the result of the work of an organization or individual to collect on a particular theme or it may be a diverse assemblage of documents with little apparent relation. Depending on the size of the holdings, it may or may not be practical to consider sound and moving image documents individually, but rather as part of a collection where the whole is greater than the sum of its parts.

Some institutions may prefer to select documents item-by-item rather than by broader categories such as genre, but this will depend on the volume of potential acquisitions and the number of resources the organization can devote to selection.

Significance of the Document

The significance of the audio-visual work is determined by analysis of its content and context.

Several factors are considered including the informational, aesthetic and research value of the work.

Evidential/Informational Value

All audio-visual documents have informational value to varying degrees although this information can be expressed in different ways. In a non-fictional work, such as a news, documentary or instructional production, informational value is relatively easy to assess since the direct communication of information is usually the primary purpose of the work. The informational value of a finished production, such as a radio documentary, will also differ from that of the unedited recordings, such as the taped proceedings of a conference and other intermediate elements used in the production process. Unedited materials tend to have more evidential value because the sounds and images are seen as actuality records of people, events and places. One factor to consider is whether the equivalent information might be better preserved in another medium, such as a photograph or paper record.

Works considered to be fictional, such as art videos, music or entertainment productions, may also have informational value because they can reveal profound truths, perceptions and attitudes about society. The informational value is often less obvious but equally valid as more documentary genre works.

Aesthetic Value

An audio-visual document can be described as having aesthetic value if it makes a significant contribution to the cultural or artistic record of the nation through its contents, technique or form. Art video and experimental film are genres of audio-visual works where aesthetic characteristics tend to predominate.

It should be noted that the documentary power of audio-visual records may also be enhanced by strong aesthetic values, for example, by the choice of camera shots, the shooting angle and editing.

Research Value

Trends in research demand for access to particular types of material are, in themselves, an indication of cultural values and therefore may legitimately influence selection criteria.

It should be noted that the process of selection can of itself affect the direction of potential research. The selection of one kind of audio-visual work over another creates potential biases in future research. For example, detailed holdings in radio drama (including tapes, scripts and other contextual documentation) will likely result in more research for this area than in other areas of broadcasting that are less well documented. A balanced representation of all types of audio-visual materials in the archival community is vital to ensure that a broad range of research needs can be met. This might be best accomplished by a network of small archives, each with a narrow

acquisition focus, rather than a single institution with too broad a mandate.

Form/Medium

Physical condition is an important practical consideration which must be assessed in relation to the organization's resources, notably the cost of preservation. Because all audio-visual recordings rely on playback technology in order for their contents to be understood, the physical condition, quality and dominance of the format will be primary considerations - there is not much point in saving a deteriorated nitrate film, an inaudible audiotape or obsolete videotape if no information can be retrieved. In selection decisions, materials of higher technical quality may take precedence over materials of lower quality. For example, where the original elements of a film have not survived, a 35mm print could be preferable to a 16mm print.

Documents which are easier to play back (current formats) may take precedence over those which could pose difficulties (obsolete formats). For example, an identical recording on Digital Betacam could be preferable to a 2" Quadruplex recording, even if the quadruplex is technically the "original."

Sound and moving image documents are not of enduring value simply because of the medium on which they are found. A watercolour is not more valuable than a lithograph, any more than a film is more significant than a videotape. Nevertheless, a preference may also be expressed for documents on film over videotape, because, for technical reasons, film is a more stable medium than an electronic recording.

The medium and the content have to be considered in relation to one another. The medium has to be considered in relation to physical condition and to whether the document is an original, a copy or an intermediary element in the production process.

Uniqueness/Rarity/Age

When devising selection principles, it is important to remember that time has contributed to a process of natural selection for many audio-visual documents of the past - highly-combustible nitrate film, a lack of appreciation for the value of audio-visual works beyond their immediate financial return; the live transmission of early radio and television broadcasts (meaning, often, that they were never recorded in the first place), fragile glass-based recording discs commonly used for radio programs during the Second World War, and erasable video and audiotape.

Uniqueness, rarity and age are similar concepts which are so interrelated that it is useful to consider them together.

Uniqueness is important in the world of art objects and museum artifacts, but poses a problem for the evaluation of audio-visual documents which exist in multiple copies and are easily reproducible. An archival document or collection is unique if it is "one of a kind" and not available anywhere else. For audio-visual documents this could apply to unique information

contained within the document, such as a sound recording which is the only existing record of a speech given by a political figure. Uniqueness could also apply to the document itself, as an artifact. For example, the only surviving reel of a feature film would be considered unique, even if many copies of the film were made in the past.

Uniqueness can also apply to the original or first-generation copy of an audio-visual work even if successive generations are plentiful. When the original is not known to exist, the best extant copy could become the "original." Different versions of the same audio-visual work can also be valued as unique items. Content changes, through censorship, public opinion or translation, may dictate that a document has been changed sufficiently to cause the document to become unique and therefore might be considered as another "original."

Rarity is associated with documents which are known to exist in very limited quantities or which themselves document events of a very infrequent occurrence. Rarity is also often closely associated with age, since older audio-visual documents tend to be more rare. However, rapidly-changing technology, making formats obsolete and unplayable, as well as the ability to re-record magnetic tape, means that relatively new audio-visual documents can also be rare.

Television newscasts predating the 1980s are considered rare because videotapes were either never made by the network or were erased and reused for new programs. As a general rule, all television broadcasts prior to 1960 are worthy of special consideration while all radio broadcasts and all films prior to 1950 are valuable as well as any recorded music before 1970. Rarity is not necessarily related to historic importance. Newsreel footage of important political figures during the 1930s is relatively plentiful, but what is rare is footage of unemployed workers.

Commercial Value

Because audio-visual documents can be reused, they have both a research value and a commercial value. For some, the commercial potential is the most important value of audio-visual documents, particularly for those agencies involved in re-broadcasting, distribution or resale through stock-shot and sound libraries.

An institution collecting audio-visual documents of enduring value for archival purposes will always be more concerned with their significance as part of the historical record rather than their use in future productions. However, just as textual documents are widely used by researchers to produce books that are read by the public, audio-visual documents can be reused to produce new works. Thus, a music recording may be reused as the soundtrack for a new feature film or archival film footage may be integrated into a video documentary.

Significance of the Creator/Author/Collector

The history of ownership or creation of an object can contribute to its significance and national importance but this alone is not sufficient to warrant acquisition or preservation. Documents

created or collected by a particular person or organization can derive their worth from the light they shed on the individual's creative process or the workings of the organization.

It is important to document the works of acknowledged leaders in the audio-visual media, such as film-makers, broadcasters and artists. It may also be appropriate to consider works by people who use audio-visual media to create documents in other media, such as authors who record interviews for books and articles. This does not mean that works by unknowns are not worthwhile. Depending on the purpose and goals of the collecting organization, this may apply to the works of individuals and organizations at the local, regional, provincial, national and ethno-cultural levels.

Impact/Popularity

The impact of an audio-visual work on society is measured by considering the audience the document or collection of documents reaches or is intended to reach, through its content and/or means of distribution.

Some organizations may measure impact by assessing the significance of the document in national, regional, local or ethno-cultural life. The emphasis on national, regional, local or ethno-cultural factors will depend on the mandate or corporate interest of the collecting institution. The content and/or the creator may have an impact on these sectors of the community. A radio or television program broadcast on a country-wide network may have impact because of the potential or real size of the audience.

As with other selection criteria, impact is not intended as the sole factor determining selection. That is, the audio-visual heritage is not served by keeping only the most popular, widely-distributed productions. The wisdom of hindsight and the development of new applications for archival productions may give new life to audio-visual documents that did not have a high impact at the time they were made. Selecting documents that are less successful by industry or audience standards help to round out the picture of audio-visual production by ensuring that the audio-visual heritage only preserves what some consider the best. Documents that are neglected or ignored at the time they are made may turn out to provide fresh, undiscovered material years later. This could apply equally to a film, television or radio series that was a critical failure or added little to the archival record, but was a commercial success and enjoyed widespread popularity and/or influenced the society of the day.

As an example, the following guidelines for broadcasters were developed in the 1960s by archivist Robin Woods. In his paper "Categories and Criteria of Program Selection for Archives and Program Resources," Woods presents several broad categories for audio-visual selection.

Historical - Audio-Visual Documents as Actuality

i) Canadian history: events; people; places; issues; contemporary themes; historical themes; cultural events; celebrations and anniversaries.

ii) World history: similar to above criteria; however, applied with an international perspective.

iii) Corporate history: firsts; lasts; anniversaries; retrospective; commissions; competitions (finals and semi-finals); specials; audience response; controversy; self-documentary; standard works; achievements; unscheduled broadcasts.

Artistic - Audio-Visual Documents as Creative Expression

The criterion which is usually proposed is excellence, sub-divided as: General excellence (any program which is an excellent example of its genre); particular excellence (programs which show outstanding merit in one or more aspects of production); awards (all programs which have won national or international awards).

Sociological - Audio-Visual Documents as an Activity

These might be considered as minimum levels of selection or retention:

Daily programs	- 6 selections per year
Weekly programs (52 per year)	- 4 selections per year
Weekly programs (39 per year)	- 3 selections per year
Weekly programs (26 per year)	- 2 selections per year
Weekly programs (13 per year)	- 1 selection per year
Less frequent programs	- 1 selection per year

Conclusion

The factors mentioned above are intended to demonstrate the kind of considerations involved in selection decisions. They are not prescriptive or all encompassing. Depending upon the weight

given to individual factors, archives and other institutions with audio-visual materials can develop their own acquisition strategies, guidelines, record schedules or other methods that will enable them to decide specifically what should be kept or acquired.

ANNEX C

ANALYSIS OF AUDIO-VISUAL HERITAGE

TARGETED CONSULTATION

Text by G. Donoghue

Important note: Opinions expressed herein reflect the views of the author and not necessarily those of the Task force.

ANALYSIS OF AUDIO-VISUAL HERITAGE
TARGETED CONSULTATION

Introduction

The consultation process involved meetings in several major cities across Canada. The cities were Vancouver, Edmonton, Winnipeg, Toronto, Montreal, Halifax, Fredericton, St. John's and Ottawa.

The participants came from a wide spectrum of the audio-visual community. They included creators, actors, producers, archivists, librarians, researchers, curators, specialists in conservation or access technologies, broadcasters, users or funding agencies from large and small organizations. The participants represented interests that were of a national, regional, local, ethno-cultural and First Nations' concern.

The attached chart is based on the notes taken at the meetings held in each of the cities visited and correspondence received from those individuals who were unable to attend the meetings, or follow-up correspondence sent to the audio-visual committee after the consultation.

The chart identifies precise problems and solutions dealing with audio-visual heritage as expressed by the participants in the consultation process. The specific comments of the participants for each city visited were then assigned to the list of precise problems and solutions. **The chart is intended to show the frequency participants referred to specific topics** and may be considered a barometer of the importance of each specific point in the opinion of the participants.

The problems and the solutions identified in the consultation process frequently show there is wide variation in the perception of what the problems are and how best to solve them. However, this is not surprising and is really an indication of the success of the consultation process as it indicates that a wide spectrum of the audio-visual community participated in the process.

The problems and potential solutions even within a specific region were frequently not shared by others in the same region, and there were differences from one region to another. However, **there are some problems and proposed solutions that not only were frequently referred to within a region but also frequently referred to in most regions.** The analysis will focus on the similarities or differences expressed by the different groups.

1. Definition of Audio-Visual Heritage

The task force defined "Canadian audio-visual heritage" for the purpose of the discussion as, "all audio-visual material of enduring value which reflects the Canadian identity, values, resources and evolution of the history of Canada and its regions, peoples, cultures and institutions."

1.1 Problem

The problem most frequently referred to dealing with all aspects of audio-visual heritage was the question of identification and selection.

The problem is two separate issues for many of the participants. The first issue is identifying what audio-visual heritage is; and the second issue is the question of selection.

i) **The identification of Audio-Visual Heritage:**

Participants referred to the lack of human resources in their organization and the sheer volume of audio-visual material being produced making it impossible to identify what material is audio-visual heritage. Participants frequently mentioned that "audio-visual heritage" cannot be identified when it is created. It is only after the passage of time that a decision regarding what is "audio-visual heritage" can be made. In addition, there is some uncertainty as to what is considered audio-visual heritage as some participants expressed the opinion that artistic value, oral productions or community productions were not included as audio-visual heritage but should be included in the definition.

ii) **The Selection of Audio-Visual Heritage:**

Some organizations believe that they must keep everything related to their mandate. However, the majority of participants expressed the opinion that such organizations must start to make choices (if they have not yet done so) - but some organizations do not know on what basis the choices should be made.

1.2 Solutions

i) **The most common solution proposed by participants to the problem of identifying and selecting audio-visual heritage was to develop criteria and guidelines at the national level with consideration to jurisdictions implementation by regions.**

Frequently, many of the participants expressed the hope that this criteria would be developed by the Task Force. Most organizations believe they must find the 5 to 10% of the records that are of greatest value, but are unsure who should make the selection (the public, researchers, archivists, producers or the artists), when the selection should be made (some felt decisions must be made immediately as the amount of material currently being produced is enormous; others felt there is a need to wait as long as 25 years and make the decision based upon usage of the material).

However, most participants expressed the opinion that there was neither enough financial nor personnel resources available to deal with all the material being produced and that the problem only becomes bigger for the future because it is not being addressed now.

ii) **Participants frequently expressed the need and desire for cooperation and private sector involvement in the process.** Participants expressed the opinion that producers must become more involved in the process by providing good quality originals, storing them in a suitable environment for reasonable periods of time and then turn them over to institutions that are prepared to keep that material which is considered audio-visual heritage. Participants expressed a desire to cooperate with one another as they perceive the problems to be too great for each to solve individually.

iii) **Participants expressed a desire to have a registry containing information on audio-visual holdings held by other institutions.** The concept of a central registry to include audio-visual holdings from various institutions is another sign by the participants of the desire and need for cooperation. In addition, the registry would identify what holdings are presently held and by whom.

iv) **Participants in some cities expressed a desire for mandatory, legal deposits of audio-visual heritage.** Some audio-visual heritage is not being deposited in institutions whose mandate it is to gather, preserve and provide access to the material. The solution proposed by some participants is to have legislation requiring producers of audio-visual heritage to deposit their productions with an archival institution.

2. PRESERVATION

2.1 Problem

The preservation of audio-visual heritage is a major concern expressed by most of the participants in the consultation process. The following specific problems are interrelated and should not be considered independently.

i) **Participants informed the Task Force that they do not have access to a proper storage environment for their audio-visual heritage.** They also told the Task Force that such storage environments frequently did not exist in their region. The lack of a proper storage environment leads to or accelerates the deterioration and loss of the audio-visual heritage records.

ii) **Participants stated that they did not have the playback equipment necessary to access some of their audio-visual heritage.** The obsolescence

of the playback equipment (i.e. the equipment is no longer manufactured, is not serviced by any company, and replacement parts are no longer available) is a major concern as it results in the loss of nearly all of their audio-visual holdings.

iii) **Participants also were concerned with the lifespan of audio-visual records and their deterioration.** Participants expressed the concern that many of their audio-visual records have a short lifespan and the additional problem of deterioration of the records which is further exasperated by the lack of proper environmental storage.

2.2 Solutions

i) **Storage of audio-visual records – the participants expressed the desire for a cooperative regional approach for storage.** Participants frequently made the point that one central cooperative storage for the country would not meet the needs of their institutions. Most participants stated that it was essential to have immediate access to the records and this could only be achieved by having regional storage centres.

ii) **Playback equipment due to obsolescence – the participants expressed the desire for cooperation.** The primary solutions suggested by the participants were to have either a centralized centre or regional centres for obsolete equipment. The underlying consensus appears to be that there must be cooperation for problems arising from obsolete equipment. There is a desire to share equipment and also to have an inventory of who has what equipment in order for participants to make arrangements to resolve their problems.

iii) **Lifespan of audio-visual records and their deterioration – the participants proposed two solutions.** First establish cooperative regional storage centres which would help extend the life of audio-visual records and slow their deterioration. Second, was the development of standards in the audio-visual field (e.g., standards for the equipment manufacturers and the raw media itself as well as standards for environmental storage and for digitizing audio-visual records).

3. Access and Use

3.1 Problems

i) **Participants in most cities found the major problem with access and use involved copyright and dealing with rights.** The problem was expressed by one of the individuals who wrote to the committee about her experiences trying to borrow a copy of a record from a public institution for a presentation in class. She advised she was responsible for obtaining permission from the

copyright holder to have a copy of the record produced by the institution. She states, however, that it is sometimes impossible to do so or when possible, the response is often received after the date required for the class presentation."

3.2 Solutions

i) **Although participants were very concerned with copyright and dealing with the rights - very few of the participants made any proposals to solve the problem.** The solutions proposed involved changing copyright laws in order to exclude cultural institutions from copyright legislation, from having a copyright boardand from having audio-visual donors give up their rights in return for the storage and preservation of their records.

ii) **A solution proposed by the participants for greater access and use of audio-visual heritage again dealt with cooperation.** Participants want to have access to other institutions and to know who has what. They also want on-line databases (lists of lists) and to be connected to the Internet.

4. Funding and Management

4.1 Problems

i) **The problem expressed frequently by participants from most of the regions is the lack of money they have to deal with their audio-visual holdings.** The participants informed the Task Force that their audio-visual holdings have been growing rapidly in recent years but their budgets have been reduced. This creates a major problem.

4.2 Solutions

i) **Participants frequently mentioned fees (user fees- cost recovery [transaction fees]) as a possible solution to the funding problems.** Some participants stated that fees should not be charged as the clients had already paid for the service. However, **most participants felt there should be fees for at least some clients for some services**. Participants generally expressed the opinion that fees should vary depending on who the client is (researcher, educator, producer), whether the service being rendered will provide financial renumeration to the recipient requesting the service, as well as the capability of the client they are serving to pay a fee.

ii) **Participants frequently referred to tax breaks and incentives to assist in the funding of audio-visual heritage.** Participants mentioned tax credits to donors and the high cost of doing tax assessments.They suggested incentives to producers such as royalties paid from fees charged for copies they produce.

There was also a suggestion of a special tax on audio-visual tape that would be for audio-visual heritage purposes.

iii) **Participants frequently referred to partnerships and cooperation to solve the funding problem.** Participants suggested partnerships with the private sector (such as Kodak or the Brofmans), as well as partnerships between large and small institutions. Participants also suggested cooperation; by sharing facilities, cooperating in producing a central registry to avoid duplication for preservation copying, and cooperating with the producers.

5. Other

5.1 Problems

i) **Participants informed the Task Force that there was a lack of communication with other institutions and a lack of marketing outside these institutions.** Participants said that there was a lack of communication between institutions regarding such matters as the mandate of each institution, the holdings of each institution, the equipment each institution has, or storage facilities at each institution. Participants also expressed the opinion that there is not enough marketing to the public so that the public knows what the institutions have to offer.

ii) **Participants also stated that there was a lack of knowledge.** The problem of the lack of knowledge is similar to the problem of lack of communication. Participants refer to such matters as not knowing what other institutions holdings are, standards for storage and the lack of specialized technical knowledge required to handle the problems they encounter with audio-visual records.

5.2 Solutions

i) **Participants suggest that education and awareness both inside and outside institutions is required.** Participants proposed newsletters and the use of Internet, to communicate and provide information concerning subjects such as storage standards and other technical information. Participants also suggested that more audio-visual productions on our audio-visual heritage should be made to raise the interest of users and the public in general.

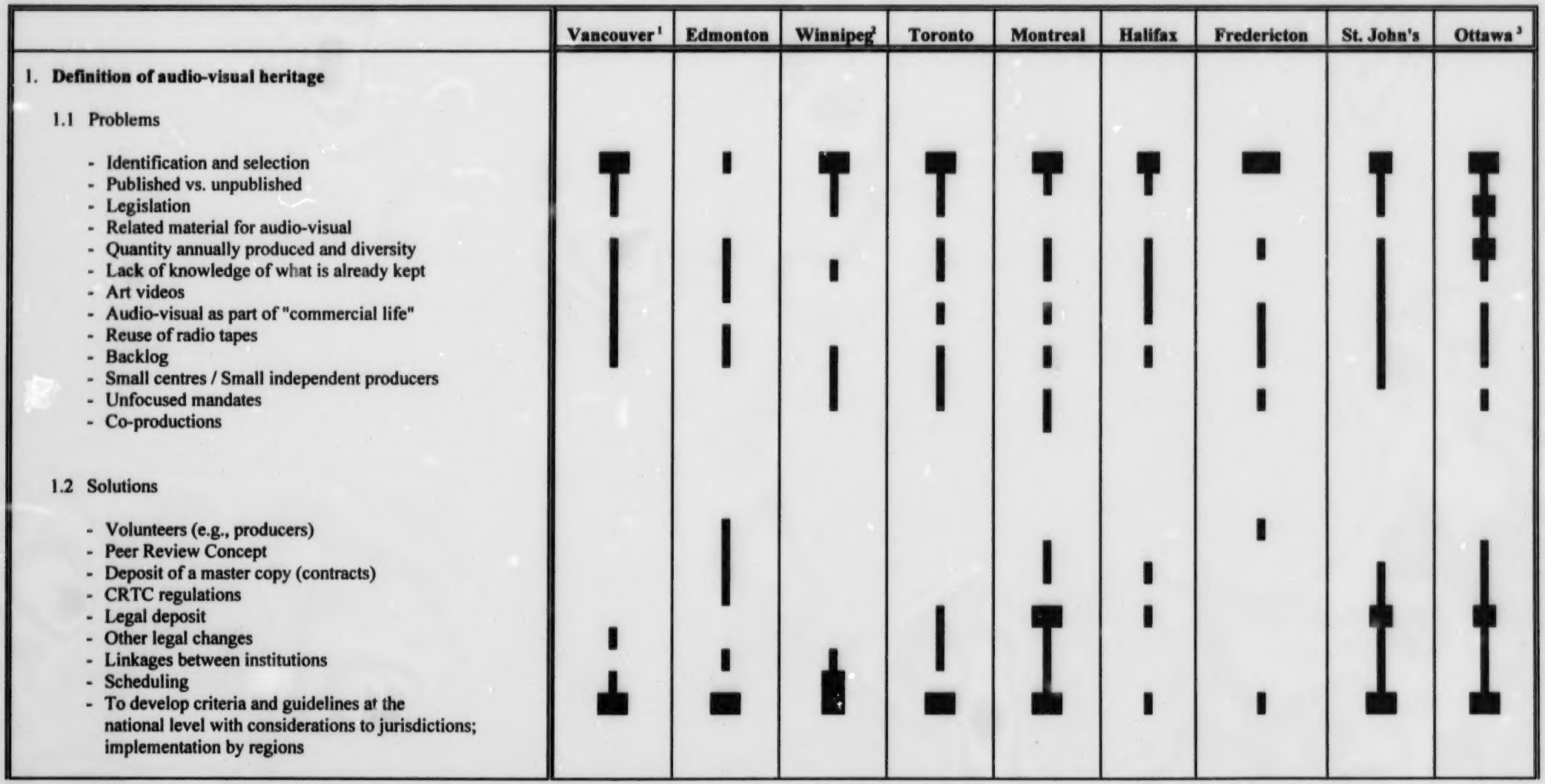
OVERVIEW

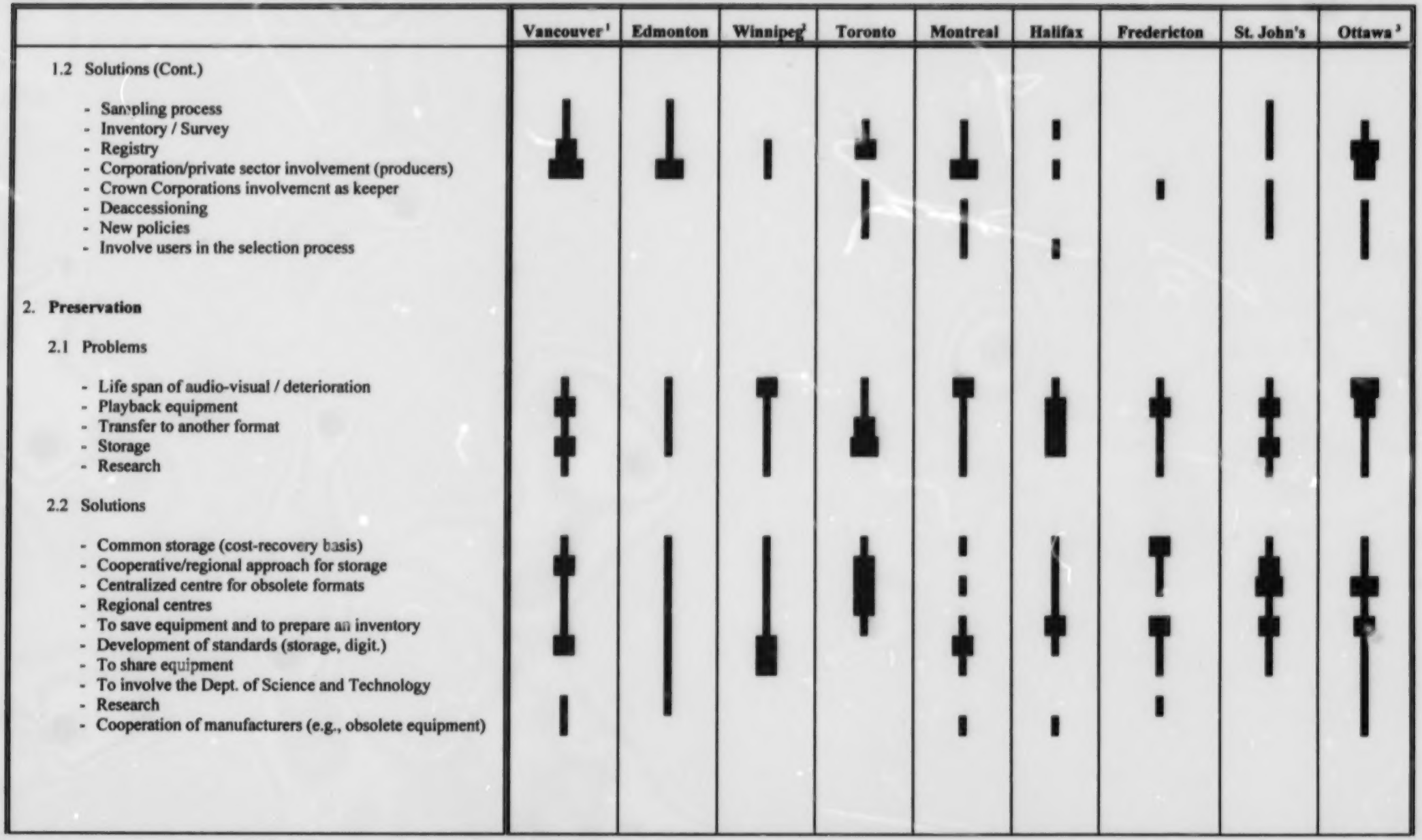
AUDIO-VISUAL CONSULTATION

▌ = mentioned (1 or 2 times)

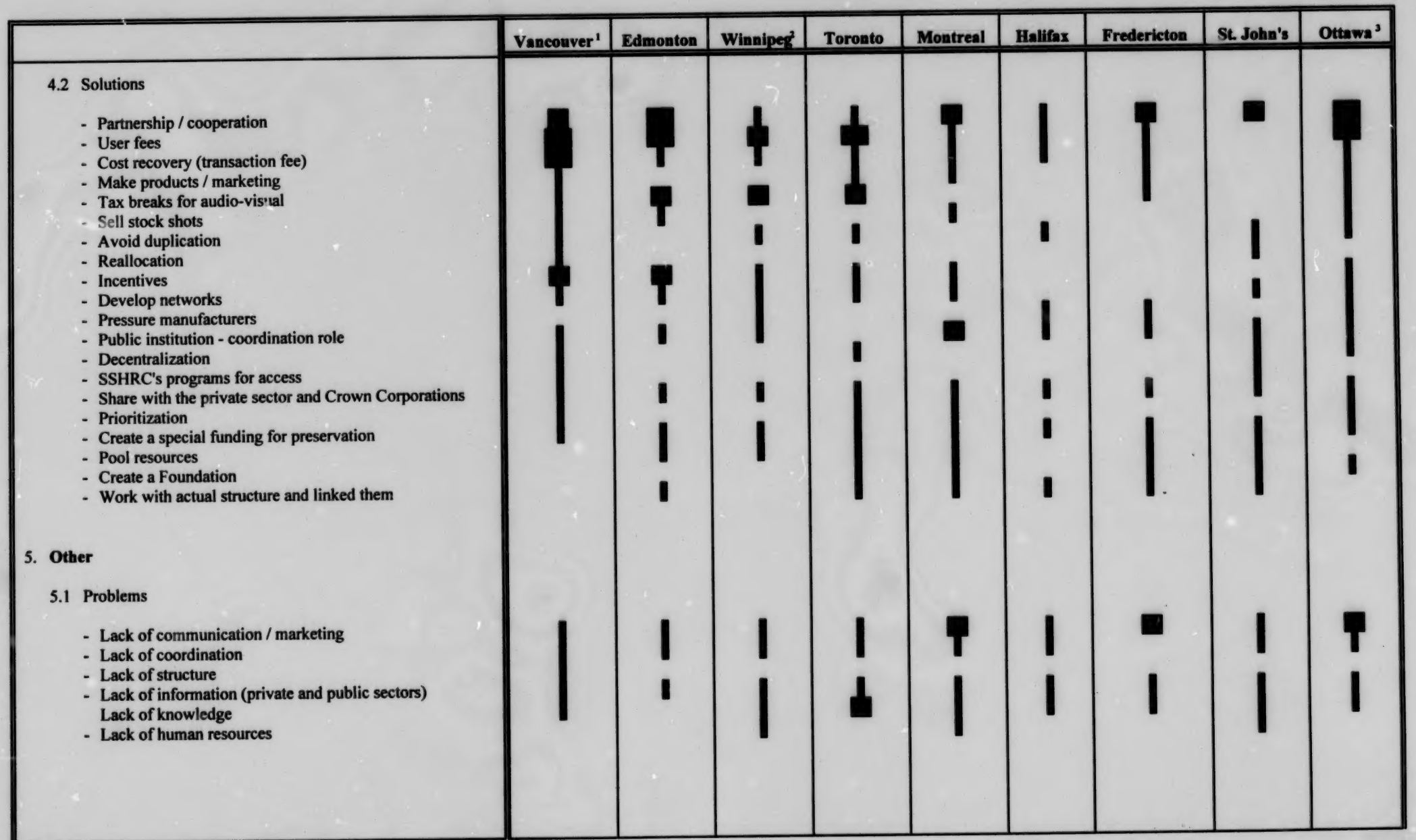
▉ = significant concern (3 or 4 times)

▉ = major concern (5 or more times)




Vancouver[1]
Edmonton
Winnipeg[2]
Toronto
Montreal
Halifax
Fredericton
St. John's
Ottawa[3]
1.2 Solutions (Cont.)
- Sampling process
- Inventory / Survey
- Registry
- Corporation/private sector involvement (producers)
- Crown Corporations involvement as keeper
- Deaccessioning
- New policies
- Involve users in the selection process
2. Preservation
2.1 Problems
- Life span of audio-visual / deterioration
- Playback equipment
- Transfer to another format
- Storage
- Research
2.2 Solutions
- Common storage (cost-recovery basis)
- Cooperative/regional approach for storage
- Centralized centre for obsolete formats
- Regional centres
- To save equipment and to prepare an inventory
- Development of standards (storage, digit.)
- To share equipment
- To involve the Dept. of Science and Technology
- Research
- Cooperation of manufacturers (e.g., obsolete equipment)

	Vancouver [1]	Edmonton	Winnipeg [2]	Toronto	Montreal	Halifax	Fredericton	St. John's	Ottawa [3]
3. Access & Use									
3.1 Problems									
- Lack of inventory									
- Lack of access									
- Copyright and dealing with rights									
- Standards									
- Access for educational purposes									
3.2 Solutions									
- Digitalization									
- Electronic linkages between institutions (Internet)									
- Online database (List of lists)									
- To invest for access (min. descript. - keywords)									
- CRTC involvement									
- Copyright Board									
- Copyright (contracts / legal forms)									
- Collective									
- Link future of audio-visual with electronic highway									
- To advocate for accessibility									
4. Funding and Management									
4.1 Problems									
- Lack of money									
- Costs: management and keeping									
- Audio-visual appraisal									
- Balance between preservation and access									
- Costs: management and access									


Vancouver[1]
Edmonton
Winnipeg[2]
Toronto
Montreal
Halifax
Fredericton
St. John's
Ottawa[3]
4.2 Solutions
- Partnership / cooperation
- User fees
- Cost recovery (transaction fee)
- Make products / marketing
- Tax breaks for audio-visual
- Sell stock shots
- Avoid duplication
- Reallocation
- Incentives
- Develop networks
- Pressure manufacturers
- Public institution - coordination role
- Decentralization
- SSHRC's programs for access
- Share with the private sector and Crown Corporations
- Prioritization
- Create a special funding for preservation
- Pool resources
- Create a Foundation
- Work with actual structure and linked them
5. Other
5.1 Problems
- Lack of communication / marketing
- Lack of coordination
- Lack of structure
- Lack of information (private and public sectors)
Lack of knowledge
- Lack of human resources

	Vancouver [1]	Edmonton	Winnipeg [2]	Toronto	Montreal	Halifax	Fredericton	St. John's	Ottawa [3]
5.2 Solutions - Create "events" to promote - Teleconference - Electronic Bulletin Board - Associations - Networking - Development of guidelines and information exchange at the national level - Implementation and development at the regional level - Education and Awareness (inside institutions) - Training and Expertise - Create a Museum of Music, Broadcasting and Film									

[1] British Columbia and the Yukon Territory

[2] Prairies

[3] Including NA and NL staff

ANNEX-C3

PARTICIPANTS BY CITY

Beyond the number of employees of the Department of Canadian Heritage (in Ottawa and the regions) and the National Archives of Canada, the following representatives from organizations and associations participated in the consultation

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James Hoaglund
Vajradhatu Archives

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ANNEX D

SOME OBSERVATIONS ON AUDIO-VISUAL HERITAGE PROGRAMS IN OTHER COUNTRIES

By Sam Kula

Important note: Opinions expressed herein reflect the views of the author and not necessarily those of the Task Force.

ANNEX D

SOME OBSERVATIONS ON AUDIO-VISUAL HERITAGE PROGRAMS IN OTHER COUNTRIES

INTRODUCTION

When the International Federation of Film Archives (FIAF) and the International Federation of Television Archives (FIAT), under contract to UNESCO, carried out a world-wide survey of moving-image archives (film and videotape) in 1985, they found a wide variety of institutions involved (archives, libraries, museums, universities and private/non-private organizations of all kinds) with different mandates and different programs. They also found that many countries in the world (more than half the member countries of UNESCO) apparently had no moving-image heritage program at all.

The survey was a follow-up to the recommendation (Recommendation for the Safeguarding and Preservation of Moving Images) adopted by the General Conference of UNESCO in 1980, which called for the establishment of an organization in every country to systematically collect, preserve and make accessible the moving images produced in that country. The survey established that very few countries had programs in place to accomplish this, and in no country were **all** the moving images of the national production being preserved by **one** organization.

Because of the wide differences in mandate and structure, it is difficult to make direct comparisons between programs in other countries with the activity in this country, and it is even more difficult to estimate the level of support, both direct and indirect, that the audio-visual heritage programs receive. In most cases, the most significant cost is staff salaries and in organizations in which audio-visual preservation is only part of the mandate, the staff involved may have other responsibilities. In the smaller organizations, staff time is divided between the archival functions of acquisition, description, preservation and restoration, and the cinematheque functions of exhibition, documentation, education and publication.

The legislative framework in which the archives operate also varies enormously, ranging from statutory deposit of every audio-visual production to a total absence of any legislation relating to the protection of this type of material. Statutory deposit is rare and most archival legislation that stipulates deposit is restricted to government records (with no mention of non-textual records) or to textual records from both the public and private sectors that meet traditional criteria of historical value.

In recent years, many of the non-governmental archives and cinematheques have been recognized by the film and television industries and they now operate under agreements with those industries that have legitimized their activities. This is in marked contrast to the sometimes hostile relationship that existed when the industry viewed the work of the archives (especially the non-governmental cinematheques) with suspicion which was due to concern over control of the physical material in order to maintain control over the intellectual property.

While some of the major sound archives in the countries included in these observations are described, the focus is on moving-image archives. In general, the problems associated with

conserving sound recordings are similar, but the costs for film and video are very much higher. With the advent of digital recording, there has been a convergence in the technology and the three non-governmental organization [IASA]), directly involved with audio-visual records, meet every three years in a joint technical symposium to share their expertise. The three organizations also meet, under the auspices of UNESCO, with representatives from the Audio-Visual Committee of the International Council on Archives and the Audio-Visual Committee of the International Federation of Library Associations to discuss descriptive standards, access and legal questions, and relations with the film and broadcasting industries.

There is an even greater variety of sound recording collections, ranging from a few hours of oral history in a museum or library to institutions such as the BBC Grammophone Library in London with 1.5 million items. The link with music libraries is strong and, in fact, IASA was established by members of the International Association of Music Libraries (IAML) in the early seventies. It now has roughly 400 institutional and individual members in over 50 countries. The North American organization linked to IASA is the Association for Recorded Sound Collections (ARSC), and there are associations for oral historians in both Canada and the United States.

This paper did not result from a world survey of audio-visual heritage programs. (FIAF published the *World Directory of Moving Image and Sound Archives* in 1992.) The countries were selected because they represented a variety of responses to the challenge of safeguarding the audio-visual heritage, responses that may be useful models on which to draw in recommending action in this country.

The organizations mentioned are either active participants in one or more of the three non-governmental organizations (FIAF, FIAT, IASA) which coordinate and foster this work or have been assigned a significant role in protecting the heritage. Some of the data on these organizations has been taken from a report prepared by Theresa Rowat (Summary Report on Audio-Visual Heritage: Comparative Approaches in Other Countries, May 1994) prepared for the Study Committee of the Task Force.

AUSTRALIA

Useful comparisons can be made between Canada and Australia because the two countries, in the size of the film, television and radio industries, the degree of government involvement in developing the domestic industries, and the mix of public and private production are roughly the same.

The key organization in protecting the moving image and sound heritage of Australia is the National Film and Sound Archives (NFSA). Established as a division of the National Library in the sixties, it has operated as a semi-autonomous agency of the Department of Communications and the Arts since 1984. As the legislation to create NFSA as a statutory authority has not yet been

passed, the Minister has appointed an Interim Council as a governing body.

The mandate of NFSA is "to safeguard Australia's audio-visual heritage, and to make it accessible, valued and enjoyed as a significant component of the nation's culture." It has headquarters in Canberra, including storage facilities and a purpose-built laboratory, with regional offices in Sydney and Melbourne, and access centres in Adelaide, Brisbane, Hobart and Perth.

In 1994, the collection contained some one million artifacts (individual reels of film, tape and discs — there is a large oral history program) and some one million pieces of documentation such as photographs and newspaper clippings. As a result of an intensive collection management project completed in 1993, NFSA has physically rehoused 750,000 items and identified some 500,000 items (artifacts and documents) for possible deaccessioning. For example, 60 reels of early film on nitrate stock, shot in Canada, have been repatriated to the National Archives of Canada, and some 1,600 reels of American film have been returned to moving image archives in the U.S. Faced with urgent priorities in safeguarding the national production, NFSA could not allocate the resources to copy them in the short term (5-10 years), and in the long term they would disintegrate. Similar projects are under way with archives in Europe and Asia.

In 1994, NFSA had a staff of 127 (78 in the national collection program which includes technical services and the preservation laboratories; 24 in public programs which includes the offices in Sydney and Melbourne; and 25 in corporate services). The budget in 1994 was $9.1 million Australian ($9.7 million Canadian). Of that, $3.5 million ($3.7 million Canadian) was for the national collection program (acquisition, control, preservation), $1.2 million for public programs, $2.5 million for corporate services and $1.9 million reserved for property expenses (see endnote #1).

There is no law of statutory deposit in Australia that applies to non-governmental producers and distributors of audio-visual productions. NSFA has negotiated voluntary agreements with State (Film Victoria, Film Queensland) and Commonwealth (national) film funding organizations, and with organizations representing the interests of television (Video Industry Distributors' Association), radio, and sound recording (Australian Record Industry Association) producers. One result is that both the Australian Film Finance Corporation and the Australian Film Commission include a clause in production contracts that require producers to deposit a new 35mm print, or a broadcast master for material edited and released on videotape, with NFSA. Producers are also encouraged to deposit their original negatives and duplicating materials with NFSA.

Under the Archives Act of 1983, the Australian Archives is designated as the official repository for all material appraised as archival produced by national government departments and agencies, including the Special Broadcasting Service (SBS), television stations (educational television), the Australian Broadcasting Corporation (ABC) and Film Australia. The Act also applies to co-productions between ABC (for example) and the private sector, or to international co-productions where national government funds are involved.

Over the years, the Archives offices, located in Sydney, have acquired over 30,000 films and some

70,000 audio and video recordings (some 6,000 metres of material!).

ABC, however, has retained custody of many of its audio-visual productions (some 70,000 documents - complete programs, news and stock shot material in all formats) and the associated documentation in its archives at Gore Hill in Sydney. There is no public access. The Archives Act stipulates that all records that have been in existence for 25 years must be transferred to the custody of the Australian Archives, unless the records are immediately needed for the ongoing administration of the department or agency. ABC has invoked this exemption in order to retain older material. There is, however, close cooperation between the Archives and ABC. For over 20 years, for example, the Archives has maintained a direct land link to ABC so that the sound recordings in the Archives are immediately accessible for reuse at ABC (see endnote #2).

Private television broadcasters cooperate with the National Film and Sound Archives in depositing selected programs, while maintaining their own archives. Since 1988, NFSA has acquired a weekly selection of news and current affairs broadcasts from a roster of private television stations across Australia. NFSA also acquires radio broadcasts that meet selection criteria from stations across Australia.

There is no national strategy at present to coordinate the work of NFSA and the other archives/collecting institutions at both the state and national level. There is, however, a voluntary initiative, Towards Federation 2001, which is fostering the development of integrated acquisition and preservation policies and programs based on the concept of a Distributed National Collection, a network of archives, linked electronically, that function as the national collection.

NFSA is now undergoing an intensive departmental program review to verify if it is carrying out its mandate effectively and efficiently, and to determine the resource level necessary to meet the estimated needs of the next ten years.

FRANCE

France has the most comprehensive legislative and administrative structure for the protection of the audio-visual heritage of any country in the world.

The legal deposit legislation of 1992 extended the application of previous legislation to all recording media published or broadcast. The legislation is comprehensive in coverage, but the application is intended to be selective, and selective directives were issued in 1994.

The legislation is also remarkably enlightened because it recognizes the necessity of maintaining a balance between preserving the cultural heritage and protecting intellectual property. It is based on the understanding that if the work is lost, both the public interest and the private interest of the author suffers.

The designated repositories for audio-visual documents - L'Institut national de l'audiovisuel (INA) for television and radio, and Le Centre national de la cinématographie (CNC) for films - are expected to protect the deposits and to ensure controlled public access. While the primary objective is to preserve the national production, the legislation applies to "certain foreign productions that have influenced French culture."

INA holds over 800,000 hours of film and videotape from six networks in vaults in Paris, and operates five videotheques across France to manage regional productions and to provide public access to the collection. A selection committee interprets the selection directives and roughly 40 percent of the total output is acquired for preservation. The percentage of retention for radio is slightly higher because the cost per hour is so much less than that for videotape, and compression is possible.

INA also samples the total output by recording one news journal per day from each network; four programs per series per year; and seven complete days of broadcast per year per network. Selection criteria have also been established for categories of material such as documentaries, variety shows, commercials, etc.

INA charges for services, packages selections from the holdings for sale and produces educational programs. In 1993, INA generated $48 million Canadian in revenue with a total operating budget of $147 million. In order to implement the new legal deposit legislation, INA was allocated an additional $4.3 million Canadian in operational funds and $13.4 million for additional capital expenditures.

CNC has operated storage facilities and a large laboratory at Bois D'Arcy since the early 1950s. Producers deposit intermediate materials or original negatives of feature films roughly five years after the initial release of the film. There is very little public access as the CNC does not manufacture reference prints and there are no cinematheque activities. The CNC has a general operating budget of just under $1 million, with additional special funding of $2.6 million per year in order to copy nitrate stock film.

The cinematheque functions are carried out by La Cinémathèque française which was established in 1936 by the legendary Henri Langlois. The CF is a private, non-profit organization that is supported by the government. The CF collection of both national and international productions is still one of the most important in Europe, although in many cases it holds only one print, donated by producers and distributors or acquired through exchange with FIAF members, which is used for research and exhibition purposes. It operates several theatres in Paris, a museum of the cinema, and organizes special exhibitions throughout France and the world.

SWEDEN AND NORWAY

Both Sweden and Norway have implemented a national strategy to protect current national audio-

visual productions in recent years. The legislation and the administrative structures are similar, but there are differences in approach. In both cases, the new initiatives do not address the preservation of past productions.

In Sweden, the Cinemateket, the archives division of the Swedish Film Institute, has been collecting and preserving film produced and distributed in the country for over sixty years. The Cinemateket is probably the oldest film archives in the world.

The Cinemateket is not a designated repository under legal deposit legislation in Sweden, although all films produced with assistance by the Institute (which is the vast majority of the films produced in Sweden) must deposit a master copy (a new print) in the Cinemateket, and in practise most Swedish producers deposit master material in order to take advantage of the excellent storage facilities and laboratory operated by the Cinemateket.

The Cinemateket also has a very important collection of foreign feature films that have been sub-titled or dubbed in Swedish that have been deposited by the distributors. The Cinemateket carries out all the functions associated with cinematheques such as documentation and research (it is housed in the same building as the film school), distribution to film clubs, publications and a full program of regular and special exhibitions in the theatres it controls. The annual budget of the Cinemateket, which benefits from many services provided at no charge by the Institute, is $1.3 million Canadian.

In 1978, the Statutory Deposit Act established the Arkivet for Ljud och Bild (ALB) as part of the National Library in Stockholm. The Act includes recorded sound as well as moving images but it appeared to be more concerned with providing access than ensuring preservation because it requires that only cassette tape copies (1/4-inch for sound, 3/4-inch for moving images) of all sound, film and television productions, and of foreign productions ("of special Swedish interest") distributed in Sweden, be deposited in ALB. No master material is required, and all film material deposited is copied to videotape cassettes and returned. Information on ALB's holdings is accessible on-line through the National Library's system and public access to the reference copy of the cassettes, for research purposes only, is possible in Stockholm and throughout Sweden by inter-library loan. ALB makes cassette reference copies as authorized under the legislation.

Sveriges Televsion AB (SVT), the state broadcaster, deposits cassette copies of all broadcasts in ALB six months after broadcast. SVT maintains its own extensive production library, including the libraries of newsfilm it acquired from the newsreel companies when it began operation in the 1950s. SVT's mandate designates its responsibility to protect this heritage. The library, which is semi-automated for physical retrieval and fully computerized for description and location, contains the usual mix of 2-inch and 1-inch videotape and the newer formats for news reporting that have been developed in recent years. Public access is restricted.

In Norway, the Act concerning the legal deposit of generally available documents was enacted in 1989. 'Generally available' relates to published in the language of the National Library of Canada Act, but there are subtle differences in interpretation. The Act revised the Deposit Act of 1939,

which was limited to printed documents, and specifically includes documents in any medium, electronic documents and multi-media documents. Two copies of films, videotapes and sound recordings are to be deposited (a master or new print and a reference copy of good quality), and the Act applies to documents imported into Norway as well as Norwegian productions. The Act, however, is not retroactive and applies only to documents produced after its enactment.

In order to implement the Act, the existing administrative structures were expanded and re-organized. A new branch of the National Library (NBR) was established at Mo i Rana in the far north of Norway to accept the deposits and to manage a new storage facility constructed inside a mountain on the site. Master copies are stored in Mo i Rana with reference copies sent to the designated organizations in Oslo. Sound recordings go to the National Music Collection at the University of Oslo. Copies of film and videotape acquisitions go to the Norwegian National Film Institute (DNFI).

Since 1992, NBR has been recording all national and regional productions from the state broadcaster, Norwegian Broadcasting Corporation (NRK) and the private channel, TV2. Selective recordings are also made from independent local radio and television stations. NRK maintains its own production library with material dating from 1959 and now holds over 100,000 items. It is regarded as a critical component in safeguarding the heritage for the period prior to the passage of the Statutory Deposit Act.

In practise, DNFI acts for ALB in monitoring film and video (not broadcast) production, and in securing the master and reference copies stipulated under the Act (see endnote #3).

DNFI is the result of a merger in 1993 of the old Norwegian Film Institute (a FIAF member for over 40 years) and the National Film Board of Norway. The Institute funds film and television production, produces films, conserves and restores film, runs an exhibition program and distributes film and video not otherwise available in Norway.

DNFI has a staff of 60 divided between a Department of Archives and Museums (with a staff of 13 in 1994), a Department of Production and International Relations, and a Department of Acquisition and Distribution. DNFI operates a production laboratory and collaborates with NBR which operates a conservation and restoration facility at Mo i Rana.

As a result of implementing the new legal deposit legislation, the government of Norway has implemented a national strategy that incorporates production, distribution, conservation and public access to moving images and recorded sound in an integrated system. There are still many problems to solve: the system is designed to prevent the losses that have occurred in the past from occurring again, but it does not address the problem of existing audio-visual resources that may be at risk; monitoring of independent film and video production (individuals or small companies) is not comprehensive; and compliance with the Statutory Deposit Act is still being resisted, especially by distributors importing films into the country. The structure is there, however, to solve these problems given the resources necessary to carry out the work.

JAPAN

Planning on the conservation of audio-visual resources in Japan does not appear to have achieved its objective, although the response of the Japanese government to the perceived need to provide some public access to the product of television is interesting.

In the late 1980s, the Broadcast Law authorized the Minister of Post and Telecommunications to designate a juristic body as the Broadcast Programming Centre (BPC), and in 1991 the BPC was established by a consortium of Japanese broadcasters. The BPC's first effort was a modest attempt to acquire prize-winning broadcasts, and broadcasts which in some way were considered to be representative of broadcasting (see endnote #4).

All deposits to BPC are voluntary, but donations are entitled to preferential treatment in terms of taxation. There is some direction in that a Preservation Committee advises on selection. Public access for research purposes is permitted at offices in Tokyo and Yokohama.

Broadcasters maintain their own production libraries, with NHK, ASAHI and FUJI active enough to send representatives to meetings of FIAT, and collectively their production libraries are considered to be the archives of television.

There is no national collection for film, but the National Film Centre at the Museum of Modern Art in Tokyo has a very important collection of national and international feature films. This is a private, non-profit organization with long-standing connections to the film industry that carries out a range of cinematheque functions.

Japan has established a central clearance agency for copyright to facilitate access to audio-visual recordings. The agency can act for the owners of rights who participate on a voluntary basis.

UNITED KINGDOM

The situation in the U.K. is of interest because of the mix of state and private support that has resulted in substantial progress in protecting the audio-visual heritage despite repeated failures to extend legal deposit for printed documents to moving images and recorded sound.

The key player is the National Film and Television Archive (NFTA), a department of the British Film Institute (BFI). The BFI receives some $20 million Canadian per year in grants from the government and some $8.8 million of that is designated for the activities of the NFTA. These activities are all archival - acquisition, description, conservation and restoration. The cinematheque functions - documentation, publication, education, exhibition and museum - are carried out by other departments of the BFI.

In addition to government support NFTA has received substantial private support, notably from John Paul Getty who donated the entire cost of constructing a new storage and processing facility outside of London.

NFTA's acquisitions from the film industry are based on negotiated agreements, often on a film by film basis, although the success rate has been sufficiently high that NFTA holds what is generally regarded as the second largest collection of film in the world (second only to the Library of Congress' copyright deposit collection) and arguably the richest collection (in terms of world feature film production) in the world (see endnote #5).

The Broadcasting Act of 1990, which restructured broadcasting in the U.K., included a requirement that the licensees fund NFTA to acquire their output by recording off air. The Copyright Act of 1988 had already authorized NFTA, and three other designated institutions, to record off air for preservation and research purposes. By 1994, this support totalled $1.3 million Canadian per year from Channel 4 and the other ITV companies.

In addition, the British Broadcasting Corporation (BBC) is required by its charter to fund NFTA to provide public research access to BBC programs. In 1994, NFTA received $100,000 Canadian from the BBC for this purpose. There is no public access to the BBC's very extensive production libraries in film, video and sound (see endnote #6). The BBC is also in the process of transferring the 2-inch videotapes they hold (some 50,000) to D-3 (as an **interim** storage format) and the original videotape is then deposited with NFTA. The ITV companies also deposit obsolete format videotape when they have been copied for further production requirements.

Overall, NFTA acquires some 7,000 programs per year by recording off air (a master and a reference copy) and an additional 8,000 programs by deposit.

The missing link in the U.K. remains legal deposit for film and sound recordings. Too many film and video productions selected by NFTA are not deposited or are only acquired many years after initial release in inferior copies (see endnote #7).

The Convention proposed by the Council of Europe may help NFTA obtain legal deposit. It calls on all member states to designate an institution to receive mandatory deposits of productions that constitute part of the nation's film heritage. Whether that includes films distributed in the country as well as the national production is still to be determined. The Convention will establish a framework, however, in which the BFI and NFTA can renew the application to secure legal deposit.

UNITED STATES OF AMERICA

The history of the moving image heritage movement in the U.S. has become well known in recent years due to highly publicized campaigns led by film and television personalities over such

diverse, controversial issues as the fading of colour films and the colorization of black-and-white films. The background to these campaigns is the deplorable fact that over half the films produced in the U.S. prior to 1930 are considered lost (there are no known copies), and that the loss rate for television production in the first 25 years of television is of the same magnitude. The result was the passage of the National Film Preservation Act in 1992 which established a National Film Preservation Board to advise the Librarian of Congress and also directed the Library of Congress to conduct a study of the state of American film preservation. This massive study, Film Preservation 1993, led to a plan of action published as Redefining Film Preservation: A National Plan (see endnote #8).

The plan stresses the importance of adequate storage facilities, addresses the issues of technological change and attempts to resolve the apparent conflict between private ownership and public access. The plan also proposes public/private cooperation with the major studios to take primary responsibility for preserving their own product. Federal funding (now provided through the National Endowment of the Arts at roughly $350,000 a year) is envisaged as inadequate to meet the needs of the program and the plan proposes the establishment of a federally charted foundation to raise funds for the preservation of orphan films (films with no clearly defined owners and no immediate commercial potential).

Film preservation, like all audio-visual preservation in the U.S., has always been a mix of federal and private programs. The Library of Congress has the largest collection in the world as a result of copyright registration legislation that requires producers and distributors to deposit copies of their works in order to register them for copyright, a feature of U.S. law that is almost unique in the world. The Library had no means of protecting the films so deposited, however, and between 1912 and 1944 routinely returned the films to the owners after they had been presented for registration. It is only from the mid-1960s that the intake has been comprehensive enough to fully represent U.S. feature film production.

Film departments in organizations such as the Museum of Modern Art in New York, the George Eastman House (now the International Museum of Photography) in Rochester and the University of California at Los Angeles built up significant collections in the 1940s and 1950s through direct contacts with the industry. These were highly selective collections based on aesthetic assessments of the films available but they managed to protect, and in some cases restore as well, a great number of titles that are now generally recognized as classics.

Although slow to act to protect their own assets, American production organizations are now actively supporting preservation and restoration projects. Paramount Studios and Universal Studios have constructed state-of-the-art vaults. Disney has meticulously restored and protected every frame of film the company owns. Corporate efforts in television have resulted in the establishment of the Museum of Television and Radio in New York City, originally entirely funded by the William S. Paley Foundation and CBS.

There are now hundreds of organizations involved in collecting and preserving audio-visual

records of all kinds. Sound archives are linked through the Association of Recorded Sound Collections, and both film and television/video archivists are linked through the Association of Moving Image Archivists (AMIA). The Secretariat for AMIA is provided by the National Center for Film and Video Preservation, a department of the American Film Institute. The Center administers the federal grants for film and television heritage programs, compiles and publishes the definitive catalogue of American film production and coordinates national programs such as the repatriation of early American film from other countries.

In recent years, there has been a very substantial investment by film and television producers in the U.S. to protect their holdings and to restore films for re-release in theatres or on video. These have included state-of-the-art storage facilities and the application of sophisticated

computer programming and digital re-mastering techniques to restore sound and image in fading or damaged films. The National Film Preservation Plan is based on the assumption that the major producers will continue to be responsible for the protection of the masters, the original material, with other institutions holding copies so they can provide public access for research and educational purposes.

ADDITIONAL OBSERVATIONS

For countries with long and rich histories in the production of audio-visual records there are obviously two major issues to resolve: What is the most effective and cost-effective way to deal with the audio-visual productions of the past that have been identified as archival which are now at risk? and, What mechanisms are required to ensure that current productions that meet selection criteria are protected in the public interest?

When resources are scarce, the cost and complexity of coping with past productions may appear to be overwhelming. On the other hand, the measures necessary to protect current production, mandatory deposit and adequate storage facilities may well be feasible. As the experience in other countries demonstrates, the issues can be uncoupled, with action taken now to prevent losses in the future (see endnote #9).

Experience in other countries also demonstrates that the public interest in the audio-visual heritage can be protected without damaging the private interests of copyright and other rights holders. It is possible for audio-visual archives and the production entities in the country (whether public or private) to exist in a symbiotic relationship in which both partners benefit and contribute to the cultural life of the community they serve.

CONCLUSION

In many countries, a conservation program based on voluntary agreements between the archives and the producers has resulted in the protection of a significant percentage of the national production **in recent years**. This is primarily because the value of the service provided by the archives in storage and conservation/restoration, at very little cost to the producer, has now been recognized. Many producers, however, are still reluctant to deposit or feel constrained by contractual obligations to exercise physical as well as intellectual control.

The extension of legal deposit to include audiovisual works generally available (to use the Norwegian formulation) in the society is the most efficient solution to the problem of protecting **all** works of archival value in the public interest. The concept of legal deposit is more than 400 years old in Europe, and a 1977 survey reported that 105 of the 157 countries surveyed had some form of mandatory deposit for printed works. The number is probably much higher today.

A rapid overview of several national responses to the issues involved in protecting the audio-visual heritage reveals that no country has combined legal deposit with the designation of a single institution as the repository for all audio-visual records. What has evolved is a network of archives in response to the realities of the cost of transferring physical custody of the huge volume of records produced by broadcasters and major film producers, and the difficulty of providing ongoing and immediate access to those records due to the urgent time constraints faced by all production organizations. Even the proposed European Convention suggests that television broadcasters may be designated to protect their own productions in an archives department.

The network concept may be even more appropriate for countries with strong regional production centres (especially those associated with ethnic or linguistic minorities), or where geography prevents a large percentage of the population from direct access to a single national archives.

The most common national strategy is analogous to the distributed architecture proposed for large computer system - a network of archives working individually to a common purpose (the preservation of the audio-visual heritage), and drawing on central servers (specialized restoration laboratories and long-term storage facilities) as required. The technology now exists to wire the archives in a network so that data on all the holdings (and from all data bases) is accessible from any archives in the system. The next step is the facility to transmit the audio-visual record itself via satellite or cable, and that too may soon be feasible.

The concept of a virtual archives in which the actual location of the record is not a factor because all holdings in the network are available on demand to users everywhere may have appeared to be science fiction 20 years ago, but it may be reality before the second century of cinematography is 20 years on.

Endnotes

1. By comparison, the budget for the audio-visual activity in the National Archives in FY 1994-1995 (salary and operating) is estimated at $3.1 million (Canadian). This does not include corporate services or property expenses. The budget for the only other audio-visual archives of any size in Canada, La Cinémathèque québécoise, was $1.7 million (Canadian) for all services in 1994.

2. Under the Archives Act, ABC retains control and ownership over the records in perpetuity, a feature of Archives legislation in Australia that is quite different from that in Canada. The Archives copies television programs before returning the originals to ABC for further use.

3. The National Music Collection acts for ALB in the same way for sound recordings.

4. This approach is indeed modest, but this is the way the Academy of Television Arts and Sciences (ATAS) collection at the Film and Television Archives of the University of California at Los Angeles first started — a home for tapes of Emmy award winners. It is now one of the largest collections of television broadcasting in the world.

5. One of the factors that vastly accelerated the growth of the collection in recent years was the decision by the government to ban the holding of nitrate film in the greater London region. NFTA operates the only licensed nitrate vaults in the U.K. and most of the producers and distributors deposited all their nitrate prints and master material. As a result, NFTA has a nitrate copying program carried out in a commercial laboratory now owned by the archives, that they estimate will cost over $40 million Canadian over the next twenty years! Most of these films are not U.K. productions. NFTA is one of the Archives in the world to have constructed new nitrate vaults in the past decade.

6. The holdings are vast and the cost is formidable. BBC Libraries and Archives, recently reorganized under a single management, now employ a staff of 500 with an annual budget of $50 million Canadian. The cost of transferring the 2-inch videotape to D-3 alone is estimated at $27 million Canadian!

7. Sound recordings are the responsibility of the National Sound Archives which is a division of the British Library. It began as a private, non-profit organization and holds a very rich and historic collection of recordings to which it adds by recording off air and through deposits from the BBC and other broadcasters.

8. The plan only deals with film because the study was restricted to film in order to complete the task in a relatively short time, and because film was regarded as being at a greater risk than video or recorded sound. A plan for video and recorded sound is to be developed in due course based on future studies to be sponsored by the Library of Congress.

9. Charging for services such as storage and transfer to new formats, and sharing in the revenue from the sale of material held in archives to third parties by copyright owners, may be one way to offset some of the costs. Many archives in North America are now attempting to establish such agreements with the owners of the material on deposit.

ANNEX E

The Conservation Of Canada's Film and Magnetic Media Heritage

Summary Report
May 1995

Document produced by:

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Important note: Opinions expressed herein reflect the views of the authors and not necessarily those of the Task Force.

Please note:

The authors of the annex have also produced some figures which are not reproduced here due to incompatible file formats. These figures are indicated by the phrase "Fig. X - absent". Interested readers may contact the National Archives (see the file Readme.txt) to obtain copies of the complete text.

PART I. FILM

by Ed H. Zwaneveld, National Film Board of Canada

1. THE NATURE OF FILM

Motion picture film consists of a light sensitive emulsion which is coated onto a flexible and perforated support.

The most common support until the 1940s was cellulose nitrate, which is chemically unstable, highly flammable and which self-destructs. It was replaced in 1951 by cellulose triacetate or safety film, when production of its solvent methylene chloride became economically viable. (Fig. 1 - Absent)

The clear base cellulose nitrate and cellulose triacetate are coated with a sub-coat or subbing layer, which assures that the gelatin emulsion on one side and the soluble light-absorbent and anti-halation backing on the film base side will bind properly. Finally, the emulsion side is coated with a supercoat to protect the emulsion from light scratches and surface friction. The anti-halation backing prevents unwanted base surface reflections from being exposed during shooting.

Properties of cellulose triacetate

Most cellulose nitrate-based materials have been re-mastered to cellulose triacetate (safety) film which de-esterifices and becomes increasingly more acidic due to interaction with relative humidity above 30% and any temperatures higher than refrigeration. Its decomposition process also produces film support shrinkage, often accompanied by curl or buckle.

Its passage over sprockets and through gates frequently results in perforation tears, which are seen as jitters and abrasions during screening of the prints or viewing of video transfers. Splices frequently dry out in time.

Recent research has confirmed that **polyester** film base material does not suffer from the acidity problems of triacetate base films and lasts much longer, except it also suffers from dye fading.

Polyester film base materials have been used since the 1960s for microfilm camera and print stocks and for developing machine leaders. Since the mid-1970s, it has also been used (at the NFB) for magnetic sound film stocks. In a much thinner form, it is used for video and audio tapes. However, it is not suitable for motion picture camera stocks because it stiffens in cold weather and causes camera problems. (Similar problems occur with video equipment.)

Eastman Kodak have told us that triacetate film base camera stocks will soon be replaced by a more appropriate film base.

Polyester remains the most appropriate replacement for sound negatives and all color and

black/white intermediates and prints. It is environmentally much friendlier to manufacture and recycle than triacetate, and wears out much slower, while it lasts ten times longer than triacetate stock. Polyester is far more chemically stable, does not suffer from acidity increase in time; is very tough and nearly impossible to break or tear; does not shrink significantly and is more easily charged electrostatically and therefore, attracts dust.

In the camera, it stiffens significantly in extremely cold weather. It is excellent as an intermediate protection master and duplicating master and optical sound negative, as well as projection print, because it wears very slowly and lasts many times longer in terms of passes through equipment transports as well as when stored. It does not permit solvent splicing, which makes it unattractive for negative cutting.

Colour film introduces the variable of colour dye fading, which is a serious problem for any film stored at room temperatures and in darkness. To be reduced to a manageable fading rate, it must be refrigerated, irrespective of whether the film base is cellulose triacetate or polyester.

Dye fading (see endnote #1) is measured in increments of 10% at an original density of 1.0. The yellow dye is the quickest to fade; reduced colour contrast and density in excess of 30% will result in either blue shadows or yellow facial highlights. The further fading is allowed to continue, the more objectionable this information loss will be. Colour film dye fading can be slowed down by colder storage temperatures, which at -18 degrees Celsius will extend the expected life of dyes to be increased by a factor of 340 as compared with room temperature storage. As a rule of thumb, Kodak research (see endnote #2) has demonstrated that on average, colour film dyes will last fourteen times longer at 4.4 degrees C., and about 20 times longer at 1.7 degrees C., than when stored at room temperatures of 24 degrees C. and 40% RH.

Any **colour camera negative film** made by Eastman Kodak, Fuji or Agfa-Gevaert before 1983, which has not been refrigerated or frozen, is probably already faded beyond 30% and should be re-mastered onto polyester intermediate film. Any colour intermediate master material, made before 1986, is probably faded beyond the 30% level, and should be re-mastered onto polyester intermediate film. Any colour print made by any of the above manufacturers before 1982 and stored under the same poor conditions, is probably faded beyond the 30% level, and if used as a colour reference print, or if used as a master for reformatting film to video, should be reprinted on current polyester colour print film.

Kodachrome Camera Film and Kodachrome Color Reversal Print Film will not fade for 6.5 years, when stored at 40 degrees C., and 40% RH; or for 9.5 years, when stored at 24 degrees C.; or in 1,300 years when refrigerated at 4.4 degrees C., and not for 1,900 years, when stored at 1.7 degrees C. The weakest link here is the triacetate film base on which this emulsion was coated, which will be affected by the vinegar syndrome, unless frozen at -18 degrees C.

Polyester film, unlike triacetate film, is not subject to the vinegar syndrome, and in most respects will exceed life expectancy of triacetate film by a factor of 10, although if used for colour film, it remains subject to the refrigeration or freezing requirement, to save the colour dyes.

Properties of Cellulose Triacetate
(For sheet 0-005 in. thick.

Relative humidity, 50% at 70° F)

PROPERTY	VALUE
Specific gravity	1-28
Refractive index	1-48
Water absorption	5-5%
Linear swell in water	0-8%
Tensile strength	14,000 lb/in^2
Ultimate elongation	35%
Modulus of elasticity	5.5 x 10^{5}lb/im^2
Folding endurance (MIT)	45
Tear resistance	50 gm
Heat distortion	150°C
Resistivity	10^{16} ohm/cm^3

Fig. 2 Properties of cellulose triacetate film support

To qualify as a support for motion picture film, the film base must be tough, optically neutral and transparent, must transmit light specularly and be colourless. Chemically, it must be stable at a wide range of temperatures and relative humidities during at least 100 years. It and the images on it should not be negatively effected by chemicals used in development, and by pollutants typically found in the air of urban vaults and archives. It should resist moisture and must respect the integrity of film base-emulsion adhesion. It should resist passage through film sprockets and gates and resist wear.

During its long life, splices made should not come undone, perforations should not tear, nor should the film curl or buckle and it must remain dimensionally stable. It must have a high softening temperature, and be slow to burn.

During its passage through cameras, it must not stiffen in extremely cold climates, nor must it stick in the gate at high relative humidities, nor melt at high air temperatures. It must resist electrostatic charges during high-speed transport and not attract dust particles.

There is no currently known film base which meets all the above requirements.

Cellulose triacetate meets many conditions, but is not tough enough for extensive numbers of passes through printers and telecines. It is susceptible to abrasions and attracts of dust particles after processing. These dust particles are seen on the print as white spots. When cellulose triacetate is scratched, its refractive index requires perchloroethylene solvent immersion during printing to hide film base surface abrasions.

1. Colour film support is coated with the blue-sensitive emulsion on top and a yellow filter layer directly below it to prevent the other two layers from also picking up blue light content. (Fig. 3- Absent)

2. As shown in colour-positive emulsions, the magenta-forming, green light sensitive layer is located on top for maximum sharpness, as it contains most information.

3. Blue sensitivity of the red and green layers is minimal.

4. Film support thickness is about 0.127 mm, and each emulsion layer is about 0.00254 mm thick.

Colour dye fading is accelerated by exposure to (ultraviolet) light, high relative humidity and by heat. When stored in darkness, it is accelerated by high relative humidity and heat. (Fig.4 - absent). The degree of dye fading is not equal for all colour dyes, but is most severe for the yellow dye. The more dye is present (at the higher printing density), the lower image content, contrast will be. There is a limit beyond which colour contrast loss cannot be corrected.

Polyester film stock increases media life tenfold, as compared with triacetate film stock, and is much more robust for handling and transport through equipment. That is why optical sound tracks and all intermediates should be printed on polyester stock. If a reference print is to be preserved for an extended term, it also should be printed on polyester stock.

2. Technical proposals: FILM

#1 Recent research results demonstrate that all triacetate black- and-white and colour camera negatives and colour reversal camera originals made prior to 1983 which have been stored at room temperatures and relative humidities, will become uncopyable within 23 years and 15 years respectively, from the year of manufacture. We urge producers, distributors, laboratory vaults and archives to give the highest priority to the evaluation of the filmbase and colour dye of these materials, and to order their re-timing and re-mastering onto polyester intermediate materials. If this is not yet possible, then place such materials in near freezing or freezing environments with 20-30% RH until re-mastering can be arranged.

#2 All triacetate Colour Reversal Intermediate (CRI) materials become or were uncopyable within 12 years of manufacture. We urge producers, distributors, laboratory vaults and archives to give high priority to the evaluation of the filmbase and colour dye of these materials, and to order their re-mastering onto polyester intermediate materials, preferably made from re-timed camera negatives, if the laboratory indicates that they can be salvaged.

If this is not yet possible, then place such materials in near-freezing (black-and-white) or freezing (colour) environments with 20-30% RH, until re-mastering can be arranged.

#3 All triacetate colour intermediate materials made before 1963 are or will shortly become

uncopyable. We urge producers, distributors, laboratory vaults and archives to give high priority to the evaluation of the filmbase and colour dye of these materials, and to order their re-mastering onto polyester intermediate materials, preferably made from re-timed camera negatives, if the laboratory indicates that it can be salvaged.

If this is not yet possible, then place such materials in near-freezing or freezing environments with 20-30% RH until re-mastering can be arranged.

#4 All new triacetate black-and-white and colour and polyester colour film materials must be refrigerated at a maximum of 4.4 C and maximum of 40% RH, to assure a copyable lifetime of several hundred years. We therefore urge every vault or archive to upgrade its facilities, to include insulation panels for energy savings and refrigerate at between 1.7 degrees C. and 4.4 degrees C. and a RH of between 20-30% RH or no more than 40%, which can be attained with commercial dehumidifiers.

#5 All triacetate film materials, particularly when stored at room temperatures and RH, should be tested within the next two years for filmbase acidity using acid-detection strips, and if colour film, evaluated for colour dye fading. Colour dye fading should not exceed 30% in any of the three colour layers. In other words, printer lights from the originally approved printer lights, not be lower than 30% of the original light value of any of the three colour layers.

#6 All unventilated tin-coated iron raw stock cans and non-archival plastic containers are known to promote triacetate filmbase deterioration. We urge all stakeholders to demand proof of archival quality for new containers. Any tin-coated iron raw stock cans which are rusted inside should immediately be replaced with archival containers. The triacetate film contained in such rusted cans is actively degrading and should be evaluated using acid-detection strips. Such film should also be evaluated for colour dye fading using a colour analyzer. Pending urgent replacement of such tin-coated containers, the lower half should be slightly indented with the thumb to prevent acetic acid vapour build-up.

#7 When triacetate filmbase is already affected by the "vinegar syndrome," and if acid-detection measurement shows it to be good (blue) or fair to good (dark-green), then immediate refrigeration at a maximum of 4.4 degrees C. and maximum of 40% RH, will assure that it remains copyable for a maximum of 75 years from manufacture.

Materials which are actively degrading or showing shrinkage and warping and are hazardous to handling, must be re-mastered onto polyester intermediate materials, preferably from re-timed camera negatives or originals, if the laboratory indicates that it can be salvaged.If this is not yet possible, then immediately place such materials in freezing environments and 20-30% RH until re-mastering can be arranged.

#8 To discourage wastage and costly heroic archival salvaging actions in the future, the user community is urged to exercise its customer rights when buying film and magnetic media, and demand life expectancy and storage requirements information for each material type purchased and is urged to share such information with other users.

#9 Install cold and dry extended-term storage facilities for original camera film and colour film material, audio and video tape materials. Cool room storage, to protect the film and tape media from the moment they are used, is a good investment and greatly extends the useful life of production elements. Retrofitting storage vaults with prefabricated insulated panelling, installing a refrigeration compressor and filtered air circulation does not demand a major investment.

As will be seen from the charts at the end of this document, most situations dictate refrigeration and low RH. We recommend regional freezing storage, to extend the life of deteriorating triacetate film materials and colour film.

#10 The industry, as well as archives, should continue to pressure manufacturers (both machine and media) to develop purpose-built digital recording media and machines for extended-term life electronic media masters. Such duplicating and protection masters are currently created on temporary media during the useful life of a production. The availability of duplication and protection masters on a durable universal format and media, made when the production is still new, will greatly reduce archiving and restoration costs, which would otherwise include re-duplicating to the latest temporary media and formats every 10 to 15 years.

#11 Analogue and digital optical sound tracks on black and white polyester sound material are currently the only extended-term storage options for sound.

#12 Public access to collections should be encouraged using Internet and CD-ROM-based tools along with sound indexing and search tools.

3. THE MEDIA LIFE CHART

See the following Life Expectancy Charts by media (Figure 5, Part I and II)

Introduction to the Chart : Film

1. Types of storage conditions

The chart shows four types of storage conditions:

A. in an air-conditioned room at a temperature of 24 degrees C. and 60% RH.
B. in a refrigerated and low RH environment of 4.4 degrees C. and 40% maximum RH.
C. in a near-freezing and low RH environment of 1.7^0 degrees C. and 20-30% RH.
D. in a freezing and low RH environment of -18 degrees C. and 20-30% RH.

FIGURE 5

LIFE EXPECTANCY BY MEDIA (PART I)
FILM

MEDIA	CONDITIONS		RH	TEMPERATURE	LIFE EXPECTANCY (YEARS)
NITRATE FILM:	In good condition:	Air conditioned	20-30%	29°C	3
		Air conditioned	30-30%	24°C	6
		Freezing	20-30%	-4°C	300
		Freezing	20-30%	-18°C	1200
	Deteriorated:	Consult experts			
TRIACETATE FILM:	Black & white - 0.5 new	Air conditioned	60%	24°C	20
		Refrigerated	40%	4.4°C	450
		Near-freezing	20-30%	1.7°C	1000
		Freezing	20-30%	-18°C	2000
	Black & white - 1.0 acidic	Air conditioned	60%	24°C	3
		Refrigerated	40%	4.4°C	75
		Near-freezing	20-30%	1.7°C	250
		Freezing	20-30%	-18°C	540
	Colour - 0.5 new	Air conditioned	60%	24°C	20
		Refrigerated	40%	4.4°C	450
		Near-freezing	20-30%	1.7°C	1000
		Freezing	20-30%	-18°C	2000
	Colour - 1.0 acidic	Air conditioned	60%	24°C	3
		Refrigerated	40%	4.4°C	75
		Near-freezing	20-30%	1.7°C	250
		Freezing	20-30%	-18°C	540
POLYESTER: Multiply triacetate life by 10.					

Note: Film dye stability data can be found in the full report.

Our charts show media life estimates of sometimes hundreds of years. It should be pointed out that there still is no universal agreement about the actual life expectancy of media.

The American National Standards Institute (ANSI) in 1991, adopted a life expectancy of only 100 years for triacetate film and 500 years for polyester film.

FIGURE 5
LIFE EXPECTANCY BY MEDIA (PART II)

DATA STORAGE PRODUCT	FORMAT / TECHNOLOGY	MEDIA LIFE EXPECTANCY (years)	TECHNOLOGY LIFE EXPECTANCY (years)	RH	TEMPERATURE
ELECTRONIC RECORDING MEDIA					
3480 / 3490		10-30	5-10	40±5	18°C
Digital linear tape (DLT)		10-30	5-10	40±5	18°C
DD2		10-15+	5-10	40±5	18°C
QIC		5-30	5-10	40±5	18°C
RDAT, D8 (Exabyte 8mm data)		5-40	5-10	40±5	18°C
BETACAM SP		5-35	5-10	30-40±5	18°C
D-1, D-2		5-35	5-10	30-40±5	18°C
Audiotape	¼ inch - 2 inches	30	80	20-30	2-10°C
				30-40	18-25°C
Magnetic sound film	Triacetate	40	40	20-30	4°C max.
CD-ROM / CD-AUDIO / CD-I, etc		5-100+	?	Room conditions	
M-O		30-40+	?	Room conditions	
WORM	Pits on bimetallic alloy thin film	100	?	Room conditions	
	Ablative pits on metallic alloy (Tellurium)	30-40	?	Room conditions	
	Thermal bubble	30	?	Room conditions	
	Phase change metallic alloy	10	?	Room conditions	
	Pits on organic dye/polymer	10	?	Room conditions	

2. Key variables

The key variables which affect the preservation of film images are the condition of the film base, the colour dye and whether triacetate or polyester film is used.

Black-and-white film on triacetate based film is limited by film base life. Most damaging is high relative humidity and high temperature storage. Dark storage is required to protect colour dyes from fading.

Under the following conditions:

A. Air-conditioned (60% RH, 24 degrees C.)
New film life is 20 years, acetic film life is 3 years, before acidity doubles.

B. Refrigerated (40% RH, 4.4 degrees C.)
New film life is 450 years, acetic film life is 75 years, before acidity doubles.

C. Near-freezing (20-30% RH, 1.7 degrees C.)
New film life is 1,000 years, acetic film life is 250 years, before acidity doubles.

D. Freezing (20-30% RH, -18 degrees C.)
New film life is 2,000 years, acetic film life is 540 years, before acidity doubles.

Acetic = film already affected by acetic acid (vinegar syndrome).

3. Prior film base conditions

New triacetate film base is unaffected by acidity. Depending on prior storage history, it can have various degrees of acidity. Measured with the IPI Acid-Detection test strips, the indicator colour will show in figure 6:

Level	Film condition	Recommended actions
0 (blue)	Good - no deterioration	Refrigerate, normal film pH
1 (dark green)	Fair to good - deterioration starting	Cold storage, monitor closely, lower film pH
2 (light green)	Poor - actively degrading	Freeze to preserve - remastering to polyester advisable, low film pH
3 (yellow)	Critical - shrinkage, warping imminent; possible handling hazard	Freeze immediately. Remaster immediately, very low film pH

4. Prior color dye conditions

Colour dyes will fade, most perceptibly in the yellow dye, and most notably in high densities of the yellow magenta and cyan dyes. When fading exceeds 30% of the original colour correction light value, contrast losses which occur at different rates for the blue, green and red layers will no longer be correctable by any current means. Therefore, current colour correction values must be sampled using a colour analyzer, and compared against the original colour correction values. If, for example, the original light level for blue was 20 and now is 14 or less, re-mastering is called for because fading amounts to 30%.

SOURCES:

It is important to note that lifetimes are calculated projections based on accelerated tests and may not in the end be accurate. However, they represent the best information we have. Also, manufacturers have provided projections for some, but not all materials. We therefore recommend that upon purchase, customers should ask for such information.

We found the book by Henry Wilhelm particularly helpful and highly recommend it. (See endnote no.1)

On the subject of dye fading, Charleton C. Bard et al., Predicting Long-Term Storage Dye Stability Characteristics of Color Photographic Products from Short-Term Tests, Journal of Applied Photographic Engineering, vol. 6, no. 2, April 1980, p. 43, is an important, albeit somewhat aged, reference.

See also Annex-E2.wpd - List of National Standards prepared for the Task force.

PART II. TRAINING AND EXPERTISE

by Roger Easton and William O'Farrell, National Archives of Canada

Training in audio-visual or broadcasting is provided by a variety of academic institutions throughout the country. It is not specific to the needs of technicians working in laboratories and audio-visual archiving, and consequently, does not take into account the specialized requirements of media re-mastering or preservation practices, including knowledge about obsolete formats, treatment procedures, the use of new technology as applied to archives etc. Most ongoing preservation work is currently occurring in government laboratories or within the industry itself.

Video, and to a lesser extent, sound has an immediate problem in specialized conservation of obsolete format materials. For video, the problem is defined in terms of the elaborate equipment required to be kept operating to permit the copying of these obsolete formats. Some of this equipment has been out of use for over a decade, and only those very few people who have kept current with old technologies because of their experience in the industry or unique engineering skills are able to repair this old equipment. Very few institutions employ such specialists; it is therefore important to share this expertise in order to maximize the immediate benefits.

There is little use in developing elaborate training courses in this area, since there is currently little demand for this type of expertise. It is also important to note that this is a short-term problem, as the proposal to digitise these older materials will not require the maintenance of currently obsolete equipment, the multiple formats and the corresponding technical expertise.

The concept of a Management System (known in the broadcast and the computer industry as a Library Management System) will require a multi-faceted approach to develop the essential technical expertise. In its simplest block form, the System will be comprised of (a) digital recorders, (b) robotized tape handling and (c) computer controlled access and interfaces to the system. The skills required to support this concept will require knowledge of professional data recorders and standards, digital recording techniques, robotics and computer hardware, software and interfaces. While some institutions offer training in some of the required disciplines, it will be essential to encourage overlap to ensure the essential, well rounded, multi discipline engineering help can be developed. This is the solution for the long-term approach to the audio-visual archive.

What is clear is that a conscious choice will have to be made regarding training and development. To maintain the status quo, that of trying to maintain obsolete format equipment and formats cannot be sustained over a long term with an aging - and shrinking - pool of expertise and no provision for "succession." The long- term choice, that of embracing digital technology, robotics and exploitation of computer capabilities, has to have

the necessary training opportunities developed, as such opportunities are not readily available at the moment.

The argument can be made that digital technology will also have an impact on film archive video mastering, restoration and access. Some provision will have to be made for embracing these changes in the development of the expertise required to ensure long-term film re-mastering capabilities. However, it cannot be ignored that there is a large body of knowledge on the physical and chemical properties of film, and opportunities will have to be developed to promote the exchange of such information, as well as helping to develop specialists capable of dealing with complex conservation issues. Collaboration should be formalized and overlap rationalized.

Digital restoration

Sound noise and click removal software has already enabled valuable recordings to be re-issued. Similar tools, such as Adobe PhotoShop software, exist for digitally-scanned still images and photograph restoration.

During the last few years, especially to enable integration of digitized motion picture and video images for visual effects and titles, high resolution scanners, powerful software and fast film recorders have expanded the scope of film restoration, even colorization of black-and-white productions. Systems, such as the Kodak Cineon, Quantel Harry and IBM Power Visualization, enable dust busting, scratch and grain removal, sharpening of unsharp images, even the restoration of severe dye fading, and the addition to invisible content modification. The power of such tools will certainly expand and provide the ultimate and invisible means of correcting and restoring severely damaged or deteriorated images.

TRAINING PROPOSALS

#1 Stakeholders are urged to publish advisory information to educate all stakeholders to apply appropriate preventive measures in handling, maintaining, storing and restoring media.

#2 A cooperative approach to share expertise and technology should be implemented to better use existing resources. The Association of Recording Sounds Collections agrees with the view that sound archivists should solicit the cooperation and expertise of their audio engineering and industry colleagues to develop and exploit new technologies for the improved preservation, playback and remote delivery of the signal of sound recordings.

#3 For stakeholders to support, implement and store media assets properly, storage recommendations must be followed. There first needs to be a general awareness and information sharing campaign aimed at promoting improved handling and storage.

There also needs to be training and on-going quality control. It is no more prohibitive for a vault or archive to be equipped with cold and dry storage for media than for the dairy or electronics industries to preserve their goods. Preservation is everybody's business, it is the business of producers, labs, post-production houses, broadcasters, storage companies and archives.

#4 Additional recommended practices and specific engineering guidelines that focus more on media handling and additional storage requirements are required. They should deal with such things as static control to reduce "negative dirt" sensitivity, perforation wear, dye fading, binder deterioration, etc. It is only through well-documented recommendations and an active participation in standard bodies that these specifications will be developed. Publicly funded institutions such as the Canadian Broadcasting Corporation, the National Film Board of Canada and the National Archives of Canada are viewed as credible participants in the development of recommended practices since they do not represent any commercial interest. Because of this, stakeholders can certainly take a unique leadership role in the development of recommended practices, and where appropriate, universal standards.

#5 Means of maintaining such expertise include on-the-job training and exchange programs and;

- The implementation of an orderly succession apprenticeship approach;
- Internships in other countries if resources do not exist in Canada;
- Attendance at seminars and conferences;
- Informal worldwide networking via the Internet;
- Regular and on-going contacts with the production, broadcasting and service industries (i.e., labs, post-production houses, specialized restoration and storage services); and
- Keeping current on research and development findings, and sharing the information through a Canadian Heritage Preservation Home Page on the World Wide Web Internet.

#6 Keeping track of research and development by manufacturers of media and equipment and universities being conducted internationally and;

- Communicate research findings through the Internet, newsletters and organizations;
- Develop partnerships with organizations specialized in film and magnetic research

and development worldwide;

- Participate in activities and publishing findings to establish Recommended Practices.

#7 Among the many new technologies, there is certainly a need to at least keep track of magneto-optical disk technology and;

- "Library Management Systems" for the management and maintenance of collections and to provide public access;
- Interactive technology applications for archives;
- Environmental control systems for cold and dry storage, temperature, humidity control, and to eliminate the effects of pollution through air filtering with activated carbon and zeolite-based molecular sieves;
- New magnetic media (i.e., barium ferrite and metal evaporated products);
- New recording media developments;
- Digital optical film technology for extended-term digital audio, video and film mastering;
- Media condition monitoring technology, such as acid-detection strips; and
- New and inert media packaging and storage containers.

NOTE: The issues related to training and expertise concentrate on the maintenance of expertise. Remember, it is determined that the maintenance of expertise is short-term, especially with obsolete formats. We do, however, have to maintain the knowledge and pass it on, therefore, the options are all valid as long as we can differentiate between maintenance of equipment and maintenance of knowledge and expertise.

Part III. ELECTRONIC RECORDING MEDIA AND DIGITAL TECHNOLOGY FOR THE ARCHIVE

by Tom Cavanagh, Canadian Broadcasting Corporation

1. Archival stability of digital magnetic tape & optical disk storage media

This section deals with the longevity of optical disk and magnetic tape media (see endnote #3). Physical or chemical changes in a storage medium, over time, will eventually cause it to fail. By accelerating these changes, through an increase in temperature and/or humidity, media failures can be induced in a relatively short period of time. By performing such "accelerated aging tests," failure mechanisms can be determined and media lifetimes can be estimated.

Manufacturers are providing life expectancy (LE) values for some data storage products. However, there are currently no standard methods for the determination of life expectancies. Without proper qualification of the accelerated test procedures and the life expectancy methods used, LE values for different vendors and media types cannot easily be compared. Furthermore, LE ratings may be overly optimistic because the test method does not consider all of the significant stress factors found in a "real world" environment.

1.1 Magnetic Tape Archival Stability

Magnetic tape consists of a magnetic particle within a polymer binder that is supported on a backing film. All three of these components – magnetic particle, binder and backing – are potential sources of failure for a magnetic tape medium. (Fig. 1- absent. See a similar schematic diagram of magnetic tape construction in "Magnetic Tape Storage and Handling" by Dr. John W.C. Van Bogart, National Media Lab Technical Report, June 1995.)

1.2 Magnetic Pigment

The magnetic "pigment" (the terminology is a carry-over from paint and coatings technology) is responsible for storing recorded information magnetically. If there is any change in the magnetic properties of the pigment, data can be irretrievably lost. The magnetic remanence of the pigment (M_r) characterizes the pigment's ability to retain a magnetic remanence of the pigment. Thus, a decrease in the magnetic remanence of the pigment can result in a low output signal and data loss. The coercivity (H_c) characterizes the pigment's ability to resist demagnetization. Demagnetization can result from an externally applied field, or from self-demagnetization via thermally-induced magnetic reversals. A decrease in pigment coercivity makes a magnetic tape more susceptible to demagnetization and signal loss.

The stabilities of the most common magnetic pigment types are outlined in Table 1. The information and ranking of performance is based on bulk magnetic measurements. The inherent instability of some magnetic particles does not exclude them from successful use in tape products. One of the least stable pigments is chromium dioxide. However, chromium dioxide is used successfully in 3480/3490 tape cartridges. The 3480/3490 data recorder was designed to be a very robust system that takes into account the basic instability of the chromium dioxide pigment. National Media Laboratory (NML) tests indicate that 3480 cartridges with M_r losses of 30% show bit error rates which are well below the ANSI limit. A 3480 tape cartridge can lose up to 75% of its recorded signal output and still be read by a 3480 tape drive. Thus, when system formats are considered in addition to bulk magnetic properties, one can arrive at a different view of tape stabilities.

Table 1. Stability of common magnetic pigment types. The pigments are ranked in the order of most to least stable.

Magnetic Pigment Type	Stability Information
Barium Ferrite (BaO 6 Fe_2O_3)	A stable oxide material
Gamma Iron Oxide (-Fe_2O_3)	A stable oxide material
Cobalt-modified Gamma Iron Oxide (Co- -Fe_2O_3)	Not as stable as -Fe_2O_3. The cobalt is subject to attack by acids in the binder reducing magnetic remanence.
Metal Evaporated (Co-Ni) NOTE: Metal evaporated tapes (ME) do not use the conventional pigment-in-binder tape technology. ME tapes consist of a continuous, thin layer of metal alloy which is deposited onto a base film.	The Co-Ni alloy is subject to oxidation. A protective oxide coating can be applied, but this does not completely eliminate the oxidation process. Over time, a decrease in magnetic remanence is observed as the film oxidizes. The rate of Co-Ni film oxidation can be catalyzed by pollutant gases in the environment.

Chromium Dioxide (CrO_2)	CrO_2 is a metastable oxide (Cr-IV). Over time, CrO_2 converts to the more stable oxide forms-Cr_2O_3(Cr-III) and CrO_3 (Cr-VI) -- both of which are non-magnetic oxides. Thus, magnetic remanence decreases with time.

The National Media Laboratory issues periodically a chart which gives a general overview of the stability of magnetic pigments used in digital magnetic tape formulations, when bulk magnetic properties, recording system design, and protective properties of the cassette are considered. This chart is based on the magnetic properties of the tape only and does not consider effects of tape binder and backing instabilities. The pigments are assessed on the basis of suitability for an archival medium with an assumed service life of 30 years. From this chart, it can be concluded that all pigment types are suitable for archival (30+years) storage (based on magnetic performance), if the tapes are properly stored in moderate environments. Some MP tapes are insufficiently stable at high temperatures and in "dirty" (polluted) environments.

The "Overview of Archival Stability of Recording Media" chart mentions the Battelle Class II test. This is an accelerated laboratory environment that measures the corrosive effects of low-level pollutant gases on electrical contacts and devices. A Battelle Class II, Flowing Mixed Gas (FMG) laboratory test, models air quality conditions that are typical of an office in an American urban environment. These tests have been used to evaluate the stability of metal particle (MP) and metal evaporated (ME) tapes.

Initially, these tests involved the direct exposures of tapes to the Battelle Class II FMG environment. Test results indicated severe corrosion of the tapes occurred. More recently, the NML has learned that the cassettes in which the tape samples are encased significantly protect the tape from low-level pollutant gases in the tapes in a polluted environment. (Fig.2- absent). (See endnote no.3) Without cassette protection, most MP based tapes would be unacceptable for archival storage (30+ years) in an urban or industrial environment.

The Magnetic-Media Industries Association of Japan (MIAJ) currently named the Japan Recording Industries Association (JRIA) has concluded that the shelf life of magnetic tape under normal conditions is controlled by the binder rather than the magnetic particles. Interestingly, this has been the conclusion of technical staff in virtually all tape archives for better than a decade.

1.3 Binder

The binder is responsible for holding the magnetic particles on the tape and facilitating tape transport. If the binder loses integrity – through softening, embrittlement or loss of lubrication – the tape may become unplayable and data unretrievable. Polyester polyurethanes are extensively used in tape binder systems. The polyester linkages in these polymers are subject to hydrolysis which occurs when a polyester group reacts with water to open the polymer linkage, producing an acid and alcohol groups. The produced acid groups further catalyze the hydrolysis reaction. The acid groups can also attack and degrade the magnetic particles.

The scission of polymer chains via hydrolysis reduces the integrity of the binder and results in the production of low molecular weight species that plasticizes (softens) the binder material. When water is more readily present, such as in a more humid environment, the hydrolysis reaction occurs at a much faster rate. Furthermore, a much higher equilibrium level of lower molecular weight species and broken chains exist at higher humidity levels. The hydrolysis reaction is reversible, i.e., the acid and alcohol groups can recombine to produce a polyester linkage. However, the quality of the produced linkage will not be as good as the original, so that even under constant, low humidity conditions, a degradation in binder properties will occur over time.

Some manufacturers have started to substitute polyether polyurethanes for polyester polyurethane in some tape formulations. Polyether polyurethanes are less subject to hydrolysis, but more subject to oxidation. The long-term behavior of polyether polyurethane based tape formulations is not well documented in recent literature.

Binder hydrolysis can lead to a "sticky tape" phenomenon characterized by low tape top coat modulus, high friction and /or gummy tape surface residues. A "sticky" tape can experience tape shedding, produce head clogs, result in "stick-slip" playback, and in extreme cases, seize and stop in the tape transport. All of this can lead to temporary/ permanent program loss and may cause equipment damage.

Procedures are available involving tape "baking," which can temporarily increase binder integrity allowing "sticky" tapes to be played and programs recovered. Ampex reports that treating a "sticky" tape at 50°C for three days will sufficiently firm up the binder coating so that the tape can be played. The effect of the treatment is temporary, and it is recommended that the program material on the treated tape be transcribed to new tape within 1 to 2 weeks. Tape baking should not be considered a universal panacea for the treatment of "sticky" tapes. The tape baking procedure was developed for a specific type of degradation phenomenon on specific tape types – hydrolysis of reel-to-reel audio tapes and computer tapes. For other kinds of degradation on other tape types, tape baking may actually cause more damage.

1.4 Substrate

The tape backing, or substrate film, supports the magnetic layer for transportation through the recorder. In general, the tape backing material of choice is an oriented polyethylene terephthalate (PET) film. PET has been shown, both experimentally and in practice, to be chemically stable. PET films are highly resistant to oxidation and hydrolysis. In archival situations, the PET backing will outlast the binder polymer.

The backing is a potential source of tape failure because of dimensional instability of the PET. The dimensions of the backing can change temporarily, as the result of changes in temperature or humidity, or permanently, as the result of polymer creep or relaxation. When a video/audiotrack is read, it is expected to be at the same

location as it was when it was initially "laid down" during recording. This is particularly applicable to digital recorders because of the track pitch employed, i.e., in the order of 20 to 30 microns. If the read head cannot follow the recorded track on playback, "mistracking" occurs. Dimensional changes in the backing can alter the length, position of data tracks resulting in mistracking and temporary or permanent data loss.

Backing films used for magnetic tape are preferentially oriented in the direction of the tape length. This results in anisotropic film properties. Dimensional changes in the length of the tape will not be proportional to changes in tape width. This applies to dimensional changes induced by changes in temperature/humidity and changes resulting from polymer relaxation. To increase the storage capacity of tape cassettes, thinner tape backings are being developed using highly tensilized PET base films. These tensilized films have a greater associated degree of anisotropic film properties and more disproportionate dimensional changes on changes in temperature and humidity.

The magnitude of dimensional backing changes can be reduced through the use of a different backing material. The polyaramid and polyethylene naphthalene (PEN) base films used in some tape products are less subject to dimensional changes as a result of environmental variations than conventional PET. The susceptibility of the recorded data to loss as a result of dimensional changes in the backing is recording format dependent. Helical scan recording formats can be more susceptible to disproportionate dimensional changes in the backing than longitudinal recordings. Tracks are recorded diagonally on a helical scan tape at small scan angles. When the dimensions of the backing change disproportionately, the tracks angle will change for a helical scan recording. The scan angle for the record/playback head is in a specific range. If the tracks on the tape do not correspond with the scan angle of the head, mistracking and data loss can occur. Most tape systems (DD-2, D-2, D-1, digital BETACAM) allow servicing of the read head on playback so that it can actively locate and follow a distorted data track. In a longitudinal tape system, the tracks will always remain parallel to the edge of the tape, so that mistracking is not as great a problem.

2. Digital Technology For Archives

It is widely understood that data storage requirements are growing at over 50% per year. This is compounded by the fact that our ability to rapidly process and store data creates demand for ever increasing amounts of data.

Only 1% of corporate data is stored in today s computer readable form. The bulk of information is stored on microfilm, microfiche while the paper mountain continues to grow at around 25% compounded per annum.

Storage capacity alone is not the only requirement, it is also necessary to locate and access the stored data on demand, faster than ever before, with total reliability, all at a reasonable cost. Today, there are several technologies competing for attention. For the most part, the differences are the handling and specifications of the various media in respect of data density, data rate, speed of access, ease of use and reliability.

In response, the recorder industry has already introduced a range of digital mass storage systems which effectively surpass the performance of all previous data storage devices – a series of recorders based on technology originally developed for broadcast video recording. These recorders offer data storage capacity of up to 100 Gigabytes on a single tape at data rates up to 32 Megabytes per second. Several versions of computer controlled, robotic access, multi-cassette systems, known in the broadcast and computer industry as Library Management Systems (LMS) are also available.

An LMS system can have a storage capacity up to 30 Terabytes. This is enough to store the equivalent of five years of continuous CD audio or 20,000 MPEG-2 compressed full feature movies. LMS systems are mature products and are available in the marketplace today from several manufacturers. Order of magnitude increases in storage capacity brought about by new magnetic recording technology and recorder head designs are slated for introduction on a yearly basis.

Digital processing goes together with computer processing. **The television and computer industries have converged.** This convergence is redefining the way the production industry works by providing needed solutions for instant access graphic processing speed, unlimited image and sound manipulation, transparent copying, while at the same time reducing capital equipment and maintenance expenditures.

Is there a place in archiving for digital recording and computer technology?

- ***The practice of archiving material on the original formats creates long-term recovery problems such that old and obsolete recording and playback machines must be archived as well. This problem is solvable with new technology through the implementation of an integrated system design that would make the archive holdings "format independent." Such a system would address all archiving activities and operations.***

- ***New technology system designs and hardware when introduced will allow archives to enhance the efficiency of existing operations and the access to holdings. There is the possibility of offering the same services to distant locations and archive branches that are now only available at a central archive location thus, for the first time an archive can become a "virtual archive" through the networked sharing of resources and records.***

The television production and post-production processes are rapidly moving towards the on-line usage of computer based disk storage systems "video servers." These servers allow simultaneous, access to program records by a multitude of users, at selectable quality levels. The "tapeless studio era" has begun. The "virtual VTR" was introduced in Las Vegas at the National Association of Broadcasters convention in April 1994, while later the same year, over 40 companies exhibited digital server technology at the Amsterdam International Broadcast Convention.

The ever-increasing consumer demand for new video and audio material will force an increase in production levels. The use of "video servers" will solve post-production and delivery bottlenecks by introducing computer access speed and flexibility to image and sound processing. They will provide effective solutions for flexibility problems but they will not obsolete the on-going requirement for large amounts of mass storage. Magnetic tape provides the only low-cost solution for the requirement to have the storage capacity to satisfy growing demand.

Video and audio recording is in a large measure already converted to the digital domain. Digital processing is the future because it is the only technology that removes the picture manipulation and multi-generation copy limits currently imposed by analogue technology.

Digital recorders are required to store the results of digital processing, however, for the most part storage will be done on on-line computer hard disks until the completion of the program. Not unlike the desktop computer system, "desktop television" creates the need for a dedicated archival tape recorder for program backup data storage and archival reference.

No magnetic tape produced to date has been purpose built for long- term storage in an archive. Production acquisition, and especially post-production, on video tape will decrease substantially in the near future while the need for dedicated archival recording tape will increase.

3. Recorded Tape Information Content Versus the Tape Itself

We don't have to worry about tape, machines, recorder data formats, coding decoding or compression because they are part of the machines and we will replace the machines before they become totally obsolete or when it is really worthwhile to do so (i.e., when a major increase in storage capacity becomes available). The only migration that occurs is in the universal transmission format, not the recorder format, so no penalty is ever incurred. If the universal data format changes we will simply build a conversion box to the new format; the likelihood of this happening frequently is very small given the size of the digital market and the need for a universal interface.

The idea of a permanent recorder format and tape or recording media that lasts forever is foolhardy given the pace of technological development. We no sooner find one technology before another, better, cheaper, 100-fold increase in capacity, more efficient one is introduced. We cannot allow ourselves to be sucked into the whirlpool of today's practice of conserving media and machines; it simply isn't necessary and it doesn't make economical or technical sense. It is time to leave the status quo by using reliable technology that allows us to transparently migrate for "as long as it takes" to discover a much better or yet to be invented, technology. All systems we build must be "future proof" - future being 50 to 100 years from now. The LMS system must not preclude the use of newer recording formats be they magnetic or optical; the only criterion is that they contain the robotworks with the cassette size we choose for the LMS.

A new concept must be introduced to the archival conservation of magnetic tape. Magnetic media is not a permanent storage media and so all recorded information must be periodically transferred to newer magnetic media (re-recorded). To date, no magnetic date has been purpose built for archival storage. Thus, for recorder information such as broadcast moving images and sound recordings, **it is the information or program content recorded on the magnetic tape that is of importance, not the carrier of the information (i.e., not the video or audio recording tape itself).**

A solution must be found to become recorder-format independent. Automation must be put to work to address the periodic task of re-recording the contents of a magnetic based archive and to render it independent of human intervention.

Can we become format independent and render obligatory periodic tape re-recording, manpower independent?

When converting to an all-digital operation, it would be advisable to convert to a single recording format, rather than using many, in order to minimize the preservation workload. **The cost of preserving obsolete formats plus the machines and technology to play them is increasing exponentially as each year passes. Thus, the initial cost of digital conversion, although steep, pales in comparison to the cost of maintaining the status quo.**

Certainly, the first choice of a recorder should go to a purpose-built archive recording machine that offers the longest potential service and format life.

Work has already begun with manufacturers to sensitize them to the need for a dedicated digital archive format, **but a single dedicated format, although desireable, is not obligatory for the conversion to digital recording.** It is not likely that a new dedicated archive format will appear in the near future unless there is a significant market for it.

In the interim, **the best digital recorder choice would be to use the most popular broadcast recording format in use at the time of system implementation.** It must be stressed that any broadcast digital recording format can be used within a Library Management System. The recorder format does not present a problem because the digital transmission format is universal, allowing the LMS archive to be recorder format independent (i.e., data flowing to or from the digital machine is delivered in the same transmission format no matter what recorder format it comes from or goes to).

A common digital data transmission format allows recorded information to become recorder format independent. Digitization of both audio and video allows transparent copying. Every copy is an original, thus, the on-going need for periodic transfer of material from old to new, longer life, magnetic media is no longer a problem.

The introduction of an automated Library Management System can render the periodic requirement for re-recording of magnetic tapes man-power independent.

4. A case for a digital based, computer controlled, "Library Management System" using robotic access (Fig. 3- absent)

Please note: Library Management System (LMS) definition:
A multi-cassette storage device coupled to a bank of digital television recorders by a high speed robotic arm and controlled by computers linked to the archive catalogue and index system software. The on-line cassette library can be as small as 40 cassettes or as large as several thousand; size is determined by the user application and the availability of capital dollars.

Almost all program material currently stored in archives is stored on obsolete or near obsolete tape formats. The advent of digital recording offers, for the first time, a solution to the multiple format archival problem. It is possible to become format independent because of the new standards for audio and video distribution. Today, digital tape records are output from all machines in the same digital format allowing image and sound records to be transparently copied from one recorder format onto another if or when the original recorder format becomes obsolete. The transfer from one recorder format to another can be automated using existing LMS robotics systems and software. With an LMS system, manpower costs and time constraints are virtually eliminated. A 24-hour automated copy program can be initiated and maintained as can tape verification and maintenance.

Today, it is possible to build an "on-line" archive using multi-cassette LMS systems and video servers. **LMS systems do not require the immediate conversion to digital of the complete contents of an archive because they provide a buffer between what has and has not been digitized in the archive**. It is possible to use the multi-cassette portion of the LMS with any format of analogue or digital machine to input source documents to the "near on-

line storage." Statistical information gathered by the system computer on client

accesses and requests can be readily utilized to guide archive staff to build the contents of a **"near on-line"** system that feeds the **"on-line"** servers. Using this process, it is possible to determine the priorities and anticipate the workload of the "on-line" archive providing the client access. An archive environment that is much less stressful and expensive is possible with an LMS because a system such as the one described in this paper can keep pace with user demands while being as close to "future-proof" as possible today using existing technology.

Digital systems in a robotic Library Management System allow for the total automation of the maintenance, verification and updating of all the tapes in an archive while allowing users a large choice of scaled price quality levels and wide area access to the library.

The introduction of digital technology ensures that an archive can keep pace with the increasing storage needs we know will occur. Digital storage has the capacity to absorb the known backlog of tapes. However, it does not shorten the time or remove the need for specialists to transfer and treat obsolete format recordings destined for transfer and conservation. The huge backlog of deteriorated film and obsolete magnetic tape (80% of all holdings) that has accumulated must be transferred to new digital media, but this is a "for the moment problem" and will disappear once the backlog has been cleared. The penalty for ignoring this issue is the potential loss of all the program material.

In the final analysis, digital technology offers the only affordable, practical and realistic solution to the ever growing storage and access requirements of a modern archive.

The immediate storage savings as well as the immediate ability to generate revenue introduced by a conversion to digital archiving, especially in today's financial climate, may far outweigh the enormous cost that will be incurred by maintaining the status quo.

Digital recording is cheaper in the medium term than trying to maintain obsolete technology and to store magnetic media that was never designed for long-term storage. Maintenance of the status quo virtually guarantees the eventual complete loss of all archive magnetic media holdings.

4.1 Artefact Retrieval

A library is useless unless the information kept in it can be retrieved upon request. When cataloguing and indexing are correctly implemented, searching for information held in the library or archive is accurate and complete. Cataloguing is of the utmost importance to the proper functioning of an archive.

Once an information item has been identified in the search request, its location is given and it can then be retrieved. This can be a physical retrieval from the vault or an electronic delivery of the information from a data based Library Management System

(LMS).

4.2 Public Access

Similar to the retrieval process, it is possible to provide public access to the information that is stored in the archive. Just how this is accomplished depends on the location of the request with respect to where the archive is located. To date, this has been a correspondence and time-intensive activity.

4.3 Conservation/Preservation

For any audio-visual archive to be effective, it must conserve the recorded information for future generations. It must accept records in whatever state they are, and try to ensure the usefulness of them. There is a great deal of time and technology used to protect physical artefacts such as tools or clothing from ancient times. **For information such as broadcast moving images and sound recordings, it is the information or content that is of importance, not the carrier of the information (i.e., not the video or audio recording tape itself).**

The conservation of program information to date has also had to deal with the conservation of the media because the method of recording and retrieving the information involves the use of a specific format machine. In other words, the program information is only machine readable. **Until recently, information has had to be treated as a physical artefact.**

All machine-readable records have a common problem of inevitable obsolescence of the machines and the technology used to record them originally. This results in the need for extensive hardware format preservation. Original recording and playback equipment have had to be archived along with the information stored on the tapes. Spare parts and skilled technicians with knowledge of a particular machine and format will always be a problem to source as machines become technologically obsolete. Each year, the time gap between machine introduction and obsolescence becomes shorter.

D-1, D-2 and D-3 first-generation digital recorders will be obsolete within two years while at this moment D-5, D-6 and two compression-based format machines are being introduced. It should be obvious that the variety of available recording formats is not on the decrease. Each recorder developed has been designed for a specific work place or production requirement, i.e., each recorder has a "niche." **We are moving away from today's breed of Digital Television Tape Recorders (DTTR's) to a new breed of "digital BIT-stream recorders" or "bit buckets."** These new machines are simply storage devices and will record data in whatever format it is presented on the interface. Because they are television standard independent, there is no need to include such

expensive features as pictures in shuttle, editing, slow-motion and stunt modes. The result is a significantly lower cost recorder; a dedicated archive recorder.

Although broadcasters and production houses will determine the most popular usage of each new production format, every format introduced is aimed at a specific niche in the marketplace and thus must be considered as a potential source of program tapes. To date, archiving activities have been performed in isolation from each other. With the advent of digital recording and commercial multi-cassette recorders, for the first time there now exists a Library Management System machine that can link and co-ordinate them.

Digital recorder and robotics technology when combined, offer a unique opportunity for sound and image archiving. They allow, for the first time, the opportunity to integrate and automate in one system, the transfer, storage, retrieval, presentation, conservation, error monitoring, tape degradation monitoring and records management of precious records.

This technology affords the opportunity to expand the services of an archive without adding to the day-to-day operating workload.

5. Digital Compression and its Application

Over the last few years, there has been a change in the attitude to the quality of pictures and sound which should be delivered to the home by future digital services. Previously, the philosophy adopted was that the digital services should always produce distortion-free pictures even on the most demanding of scene content. To achieve this quality, the capacity required from a digital channel must be high enough to cope with the worst-case pictures even though such pictures may occur in less than 1% of typical television programming. A more commercial judgment is to accept some distortion on these rare pictures and to trade the resultant BIT capacity savings for more resolution on the majority of pictures. It is the skill of the system designer to ensure that any distortion causes minimum subjective annoyance to the viewer.

Before dealing with data reduction, it is best to explain certain fundamental concepts of communications theory. Picture information can be divided into two categories: **redundant and irrelevant.**

It is well known that television images follow one another electronically like the frames of a moving picture film and that they are very often similar. We refer to that as redundancy. We also know that at any point in a picture the information immediately adjacent to this point is very often similar. The method of reducing all theses redundancies makes use of the similarities. The reduction of redundant information does not cause any loss and can be reversed. It is referred to as "lossless compression."

The human eye can discern certain deficiencies in the displayed image, but not others. Those it cannot discern we call irrelevancies. We also seek to reduce these irrelevancies in a compression scheme. The reduction of such irrelevancies is irreversible. The degree to which we reduce them determines the picture quality and the future ability to manipulate or work with the images. It is possible today to compress as much as 30 times without visual or aural artefacts. The removal of redundancies is referred to as "lossy compression."

Why do we consider data reduction for recording in the first place? Generally speaking, it can be said that data reduction helps to lower operational costs. This means lowering both tape material costs and tape archive costs. Data reduction results in the use of fewer expensive recording heads and lower maintenance costs. It will also reduce the capital investment costs.

It is meaningless to make comparisons, so often written about in the technical press, that digital picture quality at some fixed bit-rate is equivalent to that offered by an analogue system, such as VHS. One must ask on which picture material the comparison was made.

It must be understood that the level of compression acceptable for program production when initially introduced to users, of necessity, had to be extremely mild. Much argument occurred in the recording industry at the time of the introduction of the first two professional compression formats. Users have overcome their initial fears and have accepted compression for program production. There is a need to maintain a high level of picture quality to be able to process, copy and manipulate the image without a quality loss. Lossless or transparent coding is not possible when a reduction factor of greater than approximately two is employed. Lossy compression factors of between three and five are now considered by many to be quite satisfactory for program acquisition and presentation purposes. The level of acceptable compression is increasing about every six months (see professional MPEG-2 below). The one constraint on the allowable compression ratio is imposed by electronic editing. Any compression that occurs must occur within each picture frame and cannot take advantage of the redundancies that occur on a frame-by-frame (picture-by-picture) basis, because one must have the ability to change the order of the frames during an edit in order to compose program content or to tell a story. Elegant solutions to this problem are proposed monthly, the best of which will most likely be integrated into the professional MPEG-2 standard.

On the delivery side, such as for broadcast transmission or the cable industry, editing and high level picture quality do not pose a large constraint, so compression ratios of 20 or 40:1 and higher can and are employed. The financial attractiveness of putting 10 or 20 television channels into the space traditionally allocated for one should be obvious.

Digital storage media, robotic archive management systems coupled with the selective employment of digital compression can be effectively applied in archiving today.

The use of the maximum reasonable level of compression that can still satisfy clients while not masking the information content or visibly distorting it, can provide nearly a ten-fold increase in the storage capacity of a digital archive, at a cost equal to or less than maintenance of the status quo.

Recently, the SMPTE began work on the introduction of a professional MPEG-2 broadcast compression format that is high enough in quality to meet the most demanding broadcast production requirements while being editable and distributable on existing digital serial data links and routing switchers. This new compression format will be part of our future given the quality level it provides and the potential it introduces for substantial storage savings in broadcast archives.

However, negotiations for compression usage will probably be tenuous, so a significant amount of education and experimentation must occur first. The purists view of conservation would have us conserve both the original recorded tape and the machine to play it on. The question is: Is the really necessary, practical or affordable today?

The potential for cost savings is so great for an archive when digital technology and digital compression is employed for data storage, that its usage must be seriously explored.

6. System Concept for a Digital Archiving Library Management System (LMS)

The key assumption for this system is that **it is the information (data) recorded on the tape that is to be archived and not the tape or the recorder format. Tape is only used as a storage medium and in itself has no intrinsic value.**

6.1 The First System Element

The heart of the "LMS" is a digital audio and video recording system. LMS system recorders have the capacity to transfer existing video and audio information "transparently," i.e., because digital recording technology is used, every copy is an original. This system has enough capacity and flexibility to handle the future data requirements for **enhanced** or **extended video services** that will appear within the next few years. In other words, its data capacity makes a digitally based LMS relatively future-proof. These enhanced systems can also accommodate a wide diversity of distribution and deliverable quality levels that allow easy, multiple user, access to an archive. The hardware for the Library Management System already exists and more new management systems will be introduced in 1995.

Because the LMS stores information in the digital domain, it is the data that is preserved. The system is format independent. Information can be accessed, transferred, copied, encrypted, tattooed, delivered to distant locations and verified for

correctness, all at the same time. **The system structure does not depend on the machine playback/reading format** but rather, works independently of the hardware. As new recorders are introduced into the marketplace or dedicated for archive purposes, they can be added to the system hardware matrix without impact on the system operation. In fact, an automatic transfer from one recorder format to another can be totally automated.

Careful selection of the initial recorder format can minimize the storage media impact on the system mechanics and simplify the introduction of new or other recording formats into the system.

6.2 The Second System Element

The second major element of the system is the software for the cataloguing and indexing of the material. **To reduce the duplication of effort between major contributors of material to the archive, the software and data bases must be transferable.**

The indexing and cataloguing of the material should be done by the producer of the material. This will reduce the time in the archives for acquisition since the detailed knowledge of the material content is held by the originator. The archive would not need to re-catalogue for description, etc. Since there is vocabulary control under the Anglo American Cataloguing Rules, and Thesaurus control, the information is directly transferable to the archives and only "location field information" in the database need be updated.

This activity is not solely for the benefit of a large archive but also for production archives. By completing the cataloguing and indexing in-house, the normal searching and retrieval of material from the library can be greatly improved. The records management and control of the media itself will assist in dealing with manufacturers in the event of media problems.

Since most broadcasters are already committed to digital LMS strategies in the major broadcast centres, hardware has already been developed for their use. Thus, an LMS system designed to meet the needs of an archive is a natural progression for this technology.

The input processes are as follows:

1. Material is selected and prioritized by the archivists.

2. This material is retrieved from the library in whatever form it exists.

3. The item is catalogued, indexed and entered into the database.

4. It is then transferred to the digital domain of the LMS.

5. Upon request for retrieval, the material is searched for in the LMS on-line holdings and its location identified.

6. LMS machine-control software is told to retrieve the item and load it into the playback machine.

7. During playback of the item, the integrity of the information is checked using the error detection and correction facilities that are intrinsic to the digital recording format. If errors are outside of the accepted performance limits, a digital transfer is initiated automatically. In this way, the conservation element of archiving is continuously performed without any loss or deterioration of the original record.

8. Upon completion of the retrieval, playback and conservation checks, the catalogue information for the record is updated and the tape is returned to the library.

9. Material that has not yet been transferred to the digital domain remains in archive vaults until it is prioritized for transfer. If access to this material is requested before this point in time, the user is told that it is not yet in the on-line library, then informed of the time required to retrieve it from the vaults. Once it has been retrieved, the item is then catalogued, indexed and transferred onto a digital cassette and stored in a LMS library location. In this way, material that may become a priority, but that is not flagged as such by the archivists, can automatically be placed in the LMS on-line library without interrupting normal transferring schedules or priority.

10. The user is serviced quickly and the material is now conserved and entered into the on-line library without any apparent disruption to the normal archiving activities.

11. Once material is in the digital domain, it can be electronically delivered to any location worldwide transparently at whatever quality level the client is willing to pay without the actual storage media leaving the protective environment of the archive.

12. Information control is maintained in the archives by access codes and passwords. There is no danger of copyright infringement, etc.

13. The digital delivery system also keeps all the records management data base up to date. The LMS system also allows for statistical analysis of the library and archive activity. As well, it could automatically invoice users as required and generate the necessary reports for financial accountability, etc.

To implement a system like this, the co-operative efforts of the production, post-production services and distributors, archivists, technology experts, librarians and the associated organizations affected by the archiving activities is required.

It is important that knowledgeable people from all the areas be part of defining the system requirements and implementation. **Many of the system modules as described above already exist in one form or another. All that remains is to bring them together to build a complete archiving system.**

The cataloguing and indexing software and criteria is available in a number of forms. LMS equipment built for broadcast commercial and video-on-demand systems can be interfaced to the search and retrieval software of the cataloguing and indexing packages. Many report-generating modules are available for the records management and billing systems that might be needed. Several software programs already exist that allow for the extensive and detailed multi-level cataloguing and indexing needs of moving image archiving.

7. Copyright protection in transmitted Electronics Documents

All forms of business, from electronic publishers to archival institutions in charge of cultural heritage protection, have expressed a strong need to have tools appropriate for managing authors' rights and copyright protection for distributed digital information. The most intense demands come from providers who are rapidly losing feedback and control from users. This is particularly true for broadcasters, providers of video-on-demand and on-line systems.

The European Union formed a study group called CITED (Copyright In Transmitted Electronics Documents) which released its recommendations in report "CITED 5469." They recognized very early in their project that most protection schemes have failed because they concentrated on the physical protection layer rather than on the whole protection domain. The response was to author a CITED system that acts as the glue to make all the necessary components of a working system operational and efficient.

Briefly, the CITED system uses a three-layer approach:

1. An electronic information layer which provides access to explicit license, contract terms and conditions specifically defined for the business purpose, written by legal experts.

2. The functional layer where the rules of layer one are mapped to the various products or elements of a particular organization.

3. The process layer in which equipment, software applications, tools, firmware or

electronic processes are identified and applied to the material or products to be delivered.

A very large number of possibilities exist in the functions of the CITED environment:

- user encryption and credit checking
- encryption and tattooing of materials
- protection against "Trojan horses"
- monitoring of simple operations such as "copy, print"
- clearance of complex or combined operations, such as "if ... occurs then ..."
- management of the results of queries or applications as a newly created document
- document forwarding and licensing conditions management
- logging of operations for billing
- notarization of events in an audit trial file
- independence with the supported application

This description is intended to inform the reader rather than to propose a specific technology. Every organization is faced with the same problem today - managing and protecting information that is made available for public access. No doubt a universal copyright protection scheme will eventually be born. In the interim, the E.U. CITED system demonstrates what can be done today and may well be a model for a system that we put in place.

An important point to recognize is that **unless liaison is established very quickly with standards organizations responsible for data distribution, recorder and compression standards, to feed user requirements into new standards, the allotted space necessary for effective copyright protection and material identification, etc., may not be provided.**

8. The Virtual Archive

A single, high cost, centrally located LMS systems is neither required nor desirable. To reap their benefits and advantages, a more practical solution is to locate several lower cost, lower capacity systems throughout the country. These multiple systems could then be interconnected ("networked") to form a single, very large capacity "virtual archive."

In each location the size of the LMS system "near on-line" and "on-line" library would be determined by the number of program titles held physically in that location. Each location could then provide its own holdings maintenance, conservation copying as well as user access. This same small location would provide transfer or access to its holdings to all the other on-line systems, via the network.

Network interconnection is the key to linking several small LMS systems together to form a single archive. To users, the complete system would appear as a single system rather than

one composed of several smaller components. The archives system would thus be a "virtual archive" system.

Summary

Concern is continually expressed for the cost of digital conversion. The reality is that a conversion to digital is obligatory because if we don't go digital, we will never be able to provide flexible, revenue generating user access to the archive and because all new program material will soon be delivered in digital format. Digital recording technology is the only technology that provides cost effective solutions for archival mass storage and access both today and tomorrow. No alternative technologies are yet in view that can provide the flexibility, efficiency or automated maintenance and access afforded by digital technology.

Ideally, every archive should convert all magnetic media based analogue audio/video to digital and all acetate based films should be recopied onto polyester film, but the current level of funding virtually precludes this possibility for all but the largest of archives.

A word of caution is worthwhile when we talk of digitization of the archive. It is neither desirable nor necessary to immediately convert the complete contents of existing archives to digital all at the same time. What is required is a planned, cost conscious, progressive transfer from an analogue archive of obsolete formats and deteriorating media to the all digital, format independent, audio/video archive based on known priorities, current access statistics, the age and condition of conserved media.

The concept of preserving program content rather than the media on which they are recorded must be recognized if we are to implement cost-effective solutions to existing conservation problems with magnetic media.

There is no magic. One must recognize that tape and film chemistry make no distinction as to the available funds in an archive. The deterioration of magnetic tape binders and acetate based film will continue no matter how or where they are stored. The only practical solution to current conservation problems with magnetic media is to ensure the best possible environmental control possible to slow the deterioration while we implement a planned transfer strategy to digital technology and LMS systems.

Electronic Recording Media Proposals

Digitization is inevitable, but studies are required before making the decision to abandon the status quo for the "all-digital" archive.

I. A Working Group should be formed to document user/client requirements for a physical Library Management System including both storage and access expectations as well as

the concept of a "virtual archive." The same group should be charged with the development of a transfer strategy and work plan for digitization of targeted archives.

II. A Working Group should be formed to prepare a Library Management System paper design including the following work assignments:

A. Work should take into account the known and projected archive workload and the immediate availability of technology, including servers.

B. A number of digital LMS system designs should be costed and compared to the status quo cost of maintaining an archive and obsolete equipment over a 5, 10, 15 and 20-year period so as to determine and document digital LMS system feasibility.

All work should be done in close contact with machine and tape manufacturers and knowledgeable television engineering staff with the direct input from users/clients documented by the Working Group in Proposal 1.

C. A system implementation, time estimate and system hardware/software cost should be established for a complete LMS system including servers and encryption systems. Based on the recommendations of the Working Group in Proposal 4, the impact of various compression scenarios on system cost should be included.

D. Currently available and emerging digital recording formats and media should be considered for use as the recording devices in the LMS system. The future application of new or improved recorder formats should not be precluded by the system design.

E. Electronic copyright protection and encryption schemes should be evaluated for LMS system application.

III. Liaison must be established very quickly to feed user requirements into the standards organizations responsible for and the equipment manufacturers of:

A. header and descriptor space in data distribution, recorder and compression equipment/standards to ensure that effective copyright protection and sufficient material identification space will be designated for user applications,

B. to sensitize them to archival requirements tape life expectancy ratings and purpose built recorders and library management systems, if we are to have any hope of their being accepted and then implemented on a large scale.

IV. A Working Group should be formed to decide the level and usage of digital compression to be used in the archive system. Manufacturer input to this group is obligatory. The following questions must be answered and the decision fed to the Working Group in Proposal 2.

A. What level of compression should be employed? Four times compression means only one quarter of the storage space is required for a program with an accompanying decrease in storage media cost of nearly the same ratio.

B. Should an attempt be made to conserve program originals at their original quality level and only employ the cost benefits of compression at the time of delivery to those accessing the archive?

C. Should compression be employed to the fullest extent in order to reap the operational and storage benefits it generates given that the archive is not necessarily in the business of original quality preservation ... or is it?

D. What quality level is required for an archive? Broadcast quality or something less? The fact that broadcasters are already using 2x compression and may soon move to much higher levels must be taken into consideration.

E. Is more than one quality level and thus, compression level, acceptable for an archive for extended term storage of different types of program masters?

F. What type of compression should be employed by an archive and how should it be implemented?

1. Extremely high levels of audio/video compression that results in a noticeable decrease in image and sound quality in the interest of storing many more programs?

   Or ...

2. Compression of the number of program tapes that are allowed to be put into the archive in the interest of allowing audio and video to be conserved at the highest possible quality level?

   Or ...

3. A combination of both of the above approaches.

Endnotes:

1. Henry Wilhelm, **The Permanence and Care of Color Photographs: Traditional and Digital Color Prints, Color Negatives, Slides and Motion Pictures**, Preservation Publishing Press, Grinnell, Iowa, 1993, PP. 178; 312-319.

2. Charleton C. Bard et al., **Predicting Long-Term Storage Dye Stability Characteristics of Color Photographic Products from Short-Term Tests**, Journal of Applied Photographic Engineering, Vol. 6, No. 2, April 1980, p. 44.

3. Information in this section was sourced from Chapter 11, pp. 95 - 105 "Archival Stability of Digital Storage Media" by Dr. John W.C. Van Bogart, National Media Lab Technical Report RE-0016.

ANNEX E2

NATIONAL STANDARDS

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ANNEX F

USEFUL INFORMATION ON POLICIES AND LEGISLATION ON THE AUDIO-VISUAL HERITAGE

Text based upon discussion papers prepared by W. M. Noel and M. de Rosa

Important note: Opinions expressed herein reflect the views of the authors and not necessarily those of the Task Force.

ANNEX F

Useful Information on Policies and Legislation on the Audio-Visual Heritage

INTRODUCTION

The Task Force on the Preservation and Enhanced Use of Canada's Audio-Visual Heritage reviewed and considered a great quantity of research material in formulating its report and recommendations. Expert consultants in law and policy were engaged to review the current literature and to provide their advice on specific questions of concern to the Task Force. The following is a summary of their research and the Task Force's assessment of their work.

Legal Issues

1. Copyright

The Task Force examined the role played by copyright law in affecting access and preservation activities and considered changes to copyright which would better serve both owners and users of audio-visual material. Copyright was identified as providing legal protection in the form of moral and economic rights to those who create audio-visual material (script writers, musicians, producers) thereby allowing them to control use and access. Increasing copyright protection to equip copyright owners with new legal rights for new uses of their material arising from new technology was considered. The corollary, new exceptions to owner's rights to provide easier access was found to be a legal matter in transition.

Copyright and Audio-Visual Works

Copyright affects every stage of life of an audio-visual work. Beginning with the creation of what eventually becomes an archival record, copyright law regulates and controls the ownership of the intellectual property contained in the record. Copyright affects all stages of activity: acquisition, exploitation, preservation, access for users and further use of the record by anyone after it becomes part of an archival collection.

What Copyright Protects

In the audio-visual sector, copyright protects all types of works: video, sound recordings, animation, music, film, multimedia works and so on. Copyright regulates the use of these creations in whole, or even in part. Copyright prevents the use of these works without their owner's permission. Permission is usually given, but only if a royalty is paid. Protected uses are set out in the *Copyright Act*. For example, copying for research or preservation without permission of the owner is prohibited.

Creation

The legal rights provided by the copyright law not only entitle creators to be paid for the use of their creations, they also allow creators to control how their works are used, when and by whom. Since copyright controls the use of audio-visual material from the time a work is created to when the work becomes part of an archival collection, it is a law which directly affects the work of the Task Force.

Distinction between Owning Copyright and Owning the Object

The first stage of archival activity is acquisition. At this stage there is an often misunderstood distinction between ownership of a physical item and ownership of the copyright in the same item. For example, an archive may acquire a print of an audio-visual work. By acquiring the print, the archive will own the physical property. However, the archive will not own the copyright in the print unless it has been specifically acquired as well.

Term of Copyright: Published and Unpublished Works

There are two general rules for calculating how long copyright protection will last. One is for works which have been published. The other is for works which never have been published. Copyright does not last forever. The length of protection is set out in the law. If a work has been published, copyright will last for the life of the creator of the work, to the end of the year in which the creator dies, plus an additional 50 years. However, if the work is unpublished copyright will be perpetual. If a work is unpublished copyright will continue until the work is published plus 50 years.In practical terms, it is important to determine whether copyright has expired. Once protection ends a work is free for public use.

Public Domain

The term "public domain" is used to describe a work for which copyright has expired. What this means is that the work may be used without having to obtain the copyright owner's permission or paying a royalty.

Preservation

Under the copyright law, only the owner of the copyright has the legal right to make a copy of the work. This means that it is necessary to obtain the permission of the copyright owner to make a copy. This rule applies to copying for any purpose, including making an archival quality copy for long-term preservation or making a research copy to protect an original. Although preservation copying is taking place in archival institutions at the present time, that copying is often illegal. One objective to be achieved in a new copyright law is to enable archival institutions to preserve Canada's audio-visual heritage adequately.

Registration of Copyright

There is a need for mechanisms to identify and locate copyright owners of audio-visual works, to obtain permission and negotiate royalty arrangements, and to establish contracts for use. Under the *Copyright Act* there is a registration system which contains useful information to locate and identify copyright owners in audio-visual works.

Collectives

Another way to identify copyright owners is to form "collectives." A collective is a society consisting of a large number of copyright owners (in this case, the owners of audio-visual works). The collective represents copyright owners by receiving from them an assignment of their copyright. The society can then exercise and exploit the rights "collectively" by negotiating, on behalf of owners, a variety of arrangements with users.

A "blanket" licence to use all works in the repertoire of the collective is one model frequently used by collectives. Another is the negotiating of individual or group licences for smaller or specific uses. This model has been successfully used in the music industry for many years. Broadcasters pay annual licence fees to use virtually any music they wish, without any prior negotiation or permission. The annual fee is set by a regulatory body called the Copyright Board. Once the broadcaster pays the fee or "tariff" there is no need to be concerned with obtaining permission.

Although no consensus was reached, the Task Force considered the use of collectives for the administration of copyright in accordance with the following principles:

1. That the collective administration of copyright be regulated respecting the prices which may be charged.

   The regulatory procedures for collectives established by the 1988 amendments to the *Copyright Act* respect this principle. If a work is placed by its owner in the repertoire of a collective for administration, the royalties proposed by the collective for the use of the repertoire are subject to adjudication by a regulatory body called the Copyright Board.

2. That the possibility of a collective exercising monopoly control over copyright material be subject to regulation.

   The regulatory procedures established by the 1988 amendments to the *Copyright Act* respect this principle as well. The Act provides the Director of Investigation and Research under the *Competition Act* with the power to request a review of any licence which is not in the "public interest." One reason a licence would not be in the public interest is because it is an exercise of monopoly power over supply.

3. That collectives be voluntary organizations in that a copyright owner retain the right to refuse permission to use a work.

   The formation of collectives is voluntary under the Canadian *Copyright Act*. There is no obligation on creators of audio-visual works to administer their works through a collective. The internal operations of a collective are negotiated between the creators whose works are being administered by the collective and the collective itself. Which rights are assigned to the collective, the circumstances under which licences may be issued by the collective and the royalties which are payable are negotiated between the collective and the creator. However, to some extent the ability of an individual copyright owner or creator to insist upon an unusual licensing condition is limited. For example, suppose a feminist film producer did not want to licence users which employed female strippers. Because this film would be part of a large number of films which is licensed as a repertoire, it would not be possible to exclude a few films from particular types of uses. Therefore, the film producer in this example has two choices. One is to not join the collective and to licence each film individually. The other choice is to join the collective and accept the licensing practices established for the majority of copyright owners. In either case, there is a kind of "rough justice" which is necessary for the operational requirements of the collective. However, the right of an individual creator "to say no" is preserved under this system which is an important aspect of the system for some members of the Task Force.

4. That technology be used to the fullest possible extent to store information relating to copyright, such as ownership, licensing, collective affiliation and recording of use.

Central Rights Registry

The Japanese Institute of Intellectual Property has proposed to the international copyright community that a digital information centre be established in relation to multimedia works. The proposal involves the right holder's voluntary registration of copyright. Through the Centre, copyright holders can licence their rights to others for multimedia use. The Centre would collect royalties from users and pay registrants. A registrant can impose licensing restrictions, such as the extent to which the work can be modified. The Centre would offer information as to registered works, including a description of the work, the name and address of the right holder, royalties and licensing conditions. Technology would be used to measure use and to protect registrants from unauthorized use. One of the proposed conditions of registration is that the registrant shall consent to remuneration, rather than the right to licence. The amount of the royalty would be set by the registrant.

This model could be enlarged and applied in Canada for all media. The creation of a super-collective organization to licence the many rights attached to audio-visual material would provide "one-stop shopping" for users thereby providing easier access.

2. Broadcasting Act

What role does the broadcasting system play in preserving and enhancing access to the great volume of audio-visual material which it broadcasts every day in Canada? The Task Force examined the *Broadcasting Act* as a model for legal ways to achieve its objectives. Research showed the broadcasting system as a major user and producer of audio-visual material in Canada. The legal and regulatory mechanisms employed in the *Broadcasting Act* can also be applied to enhance access and use of audio-visual material.

The *Broadcasting Act* contains the rules and regulations under which all broadcasting activity takes place. It regulates how broadcasting licences can be obtained as well as the operating rules, powers and procedures. These technical aspects together with the broadcasting policy "declaration" contained in the Act are relevant to the work of the Task Force. The inclusion of a policy statement in a statute is somewhat unusual. Normally statutes do not contain "policy" statements. What follows is a summary of the essential elements of Canada's broadcasting policy which Parliament has set out in the *Broadcasting Act*.

The System

* the Canadian broadcasting system shall be owned and controlled by Canadians;
* the system shall consist of public, private and community elements;
* the system shall operate primarily in English and French;
* the frequencies which are used by broadcasters are public property;
* the programming provided is a public service which is essential to the maintenance and enhancement of national identity and cultural sovereignty;
* the Canadian broadcasting system constitutes a single system whose objectives can best be achieved by having one independent public authority (CRTC) provide regulation and supervision.

Objectives

The Act requires the system to strive to achieve four objectives:

1. to safeguard, enrich and strengthen the cultural, political, social and economic fabric of Canada;

2. to encourage the development of Canadian expression by providing a wide range of programming that reflects Canadian attitudes, opinions, ideas, values and artistic creativity, by displaying Canadian talent in entertainment programming and by offering information and analysis concerning Canada and other countries from a Canadian point of view;

3. through its programming and the employment opportunities arising out of its operations, serve the needs and interests, and reflect the circumstances and aspirations, of Canadian men, women and children, including equal rights, and the linguistic duality and multicultural and multiracial nature of Canadian society and the special place of aboriginal people within that society; and

4. to be readily adaptable to scientific and technological change.

Programming

* the system is required to contribute to the creation and presentation of Canadian programming;

* broadcasters are required to make maximum use of Canadian creative and other resources in the creation and presentation of programming;

* programming must be of a high standard;

* all persons licensed to broadcast are responsible for the programs they broadcast;

* the programming itself should have the following characteristics:

    1. be varied and comprehensive, providing a balance of information, enlightenment and entertainment for people of all ages, interests and tastes;

    2. be drawn from local, regional, national and international sources;

    3. include educational and community programs;

    4. provide a reasonable opportunity for the public to be exposed to different views on matters of public concern; and

    5. include a significant contribution from the Canadian independent production sector.

* educational programming is considered to be an essential part of the system;

* programming which reflects the aboriginal cultures of Canada and programming accessible to disabled persons should be provided within the Canadian broadcasting system as resources become available for the purpose.

The CBC

The CBC, as the national public broadcaster, is obliged to provide radio and television service incorporating a wide range of programming that informs, enlightens and entertains. CBC programming has eight objectives which are set out in the *Act*:

1. programming should be predominantly and distinctively Canadian;

2. programming should reflect Canada and its regions to national and regional audiences, while serving the special needs of those regions;

3. actively contribute to the flow and exchange of cultural expression;

4. be in English and French, reflecting the different needs and circumstances of each official language community, including the particular needs and circumstances of English and French linguistic minorities;

5. strive to be of equivalent quality in English and French;

6. contribute to shared national consciousness and identity;

7. be made available throughout Canada by the most efficient means and as resources become available for the purpose; and

8. reflect the multicultural and multiracial nature of Canada.

Private Broadcasters

Private networks and programming undertakings are required, to the extent that their financial and other resources permit, to contribute to the creation and presentation of Canadian programming and to be responsive to the evolving demands of the Canadian public.

The CRTC

The CRTC is the regulator of the Canadian broadcasting system under the *Broadcasting Act*. As such, it has the potential to assist in achieving the objective of preserving and enhancing the use of audio-visual material. For example, radio and television currently retain a record of their broadcasts for a short period of time. This could be extended to a longer period to enable archival examination and selection.

The CRTC is already sensitive to archival needs. In a recent licence decision (the Classic Channel) the CRTC directed, as a condition of the granting of the licence, that a minimum of $50,000 per year be spent on restoration and conservation of Canadian films. This amount was to be augmented by $5,000 per year until the expiration of the licence in the year 2000. The authority to do this is provided by the *Broadcasting Act*. Continued use of the powers of the CRTC to assist in the preservation of audio-visual material would be of assistance in achieving the objectives of the Task Force.

The Broadcasting Act and Archives

There are several areas where broadcasting policy as set out in the *Broadcasting Act* influence and affect archival activity in Canada. Because the broadcasting of audio-visual material is so closely linked to the ultimate archival preservation of the same material there is a direct co-relationship between the two.

The *Broadcasting Act* regulates the public air waves in Canada. The content of the radio, television and cable signals is the history of today. Together the news programs, documentaries and talk shows create a complete record of public opinion, current events and news events of the time. The broadcasting system communicates this to Canadians. The archival community collects and preserves that very same material for future use and consultation. In this sense the broadcasting system is closely linked to the mandate of archives.

What is being broadcast today is the substance of an archival collection tomorrow. The emphasis in Canadian broadcasting law on Canadian subject matter makes the relationship to archivists symbiotic. One simply cannot exist without the other. Yet another important link between broadcasters and archivists is that archives are becoming a source of material for reuse by broadcasters, primarily because of the high costs associated with production of audio-visual material and its historical value. It is cost effective to reuse where ever possible instead of creating or buying a new work.

3. Legal Deposit

Another important legal issue is whether existing legal deposit laws in Canada provide sufficient legal authority to adequately create archival collections. Legal deposit of audio-visual material in Canada is required under two national laws.

The *National Library Act* provides the National Library with the legal authority to require the deposit of all audio-visual material published in Canada. With respect to sound recordings and other audio-visual works, only products such as records, videos, cassettes and CDs which are manufactured in Canada and contain some element of Canadian content are subject to legal deposit.

The *National Archives Act* makes the deposit of specified audio-visual material mandatory when the National Archivist issues a written demand. The National Archivist is required to pay for the cost of the copy. This power is sufficient to enable the National Archives to obtain any audio-visual work that has been broadcast in Canada.

The two laws do not overlap. What must be deposited in the National Library cannot be the subject of a deposit demand from the National Archivist. Art film or video, however, may not fall within of either law. Outside of Canada, legal deposit is sometimes selective (France). This feature is a unique, resource conserving model.

In Quebec two legal deposit systems have been established. The first is la *Loi sur le Cinéma* which permits the Cinémathèque québécoise to obtain an archival copy of a film produced in Quebec. The second is la Bibliothèque nationale du Québec which has the legal authority to collect sound recordings produced in Quebec.

Finally, an international treaty for the registration (as opposed to deposit) of audio-visual works exists. However, Canada is not a participant in this treaty. Participation in this treaty could enhance access by increasing information to users.

4. Information Highway

What are the legal issues associated with preservation and use of audio-visual material on the new Information Highway? Research indicated that the new technologies which make up the Information Highway are challenging existing legal systems regulating the creation and use of audio-visual material. One example is multimedia works which combine audio, video, photographs, graphics, text, data and artistic works. This combination of many copyright owners creates complex contractual arrangements. Another issue is how to best maximize the opportunities being created by new markets.

Several options were identified to deal with these legal challenges:

* Create a digital information centre to facilitate contractual arrangements;
* Use patents instead of copyright to regulate the creation and use of multimedia works;
* Form a super collective which would act as a clearing house for new uses of works;
* Abolish copyright because it is impeding technological development;
* Change the copyright law to protect multimedia as one work instead of several works; and
* Formulate a separate law for new media.

One issue of concern to users is the legal consequences of what is referred to as "browsing." Does browsing through an electronic library or database involve a reproduction of the work thereby triggering a copyright infringement unless prior authorization has been obtained? One view is that browsing is analogous to glancing through books on a shelf in a library which does not trigger a copyright reproduction. Another view is that browsing requires the making of a copy in order to view the work even temporarily. This is subject to the right of reproduction. The legal issue is whether and how the copyright law should be amended to deal with browsing.

Access and Use of Audio-Visual Material

1. **Impact of Technological Development**

What is the impact of rapid technological development on the preservation and enhanced use of audio-visual material? Digital technology is the ability to transmit, combine and reproduce digitalized voice, text, graphics, images, sound and full motion video. This has led to "new media" which delivers both old and new content on new delivery systems. Technological development is causing existing networks to converge to increase their capabilities.

For example, telephone companies are using digital video compression (DVC) to get into the business of video transmission. This phenomena is being characterized as the "Electronic Highway," a "network of networks" connecting everyone to a variety of interactive services.

The Information Highway Advisory Council, formed by the federal government, is reviewing infrastructure requirements to propose a national strategy to develop an "Information Highway" to create jobs through innovation and investment, to reinforce Canadian sovereignty and cultural identity and to ensure universal access at a reasonable cost through services such as Internet and CANARIE. Audio-visual material will be an important commodity on the Information Highway. Access to that commodity is an objective shared by the Advisory Council and the Task Force.

2. **Access to Audio-Visual Material**

What are the ways to increase access to audio-visual material? The Task Force has identified access as a vital service archives provide to researchers. Access depends upon many factors:

* what is preserved;
* where it is located;
* whether the holding is public or private;
* the research tools available;

* the resources available to perform archival selection and cataloguing activities;
* the volume of material available;
* the provision of reference/consultation copying services;
* the availability of specialized viewing equipment; and
* the copyright status of the work.

New technologies such as CD-ROM can increase access, even to remote users. The Canadian Heritage Information Network, Union Catalogue and FORMAT were identified as examples of providing instant technological links between widely separate institutions. Access to information about collections and access to the holdings themselves is also possible.

Current research tools do not provide broad and easy access. There is a lack of knowledge on what audio-visual material exists. Access will be enhanced if specialized research tools are developed such as an encyclopedia or bibliography of audio-visual works.

3. **Better Use of Existing Information**

Another access issue is how to minimize the difficulties in obtaining information about audio-visual works. Databases and inventories containing useful information in accomplishing this task were identified. Examples are:

* the Canadian Heritage Information Network (CHIN) operated by the federal government through the Canadian Heritage Department;
* Film/Video Canadiana operated by the National Film Board and available on CD-ROM;
* the Register of Copyright which is maintained by the Canadian Intellectual Property Office at Industry Canada;
* the Union Catalogue which is maintained by the National Library;
* ArchiVia, produced by the National Archives, a CD-ROM containing the descriptions of its audio-visual holdings;
* Provincial Archives in Quebec, British Columbia and Nova Scotia have also produced inventories of their collections;
* the Cinémathèque Québécoise has produced the Annuaire du Cinéma Québécois, an inventory of feature length films produced in Quebec and different Répertoires.
* Cinémathèque Ontario has a database to access its video collection and a list of its repertory films.

Improvements will include linking all the electronic sources of information to create a "database of databases" which was available on the Information Highway and used uniform standards.

4. Use of Audio-Visual Archival Material

What are the ways to facilitate use of audio-visual material?

While technology is expanding traditional archive user groups, not enough is known about their demographics and computer literacy levels to effectively develop user strategies. Easier electronic access to archival holdings and new users with specialized needs, require archives to re-visit the services they provide, to consider whether fees for service are appropriate and to study who is using their services.

User fees are one way to respond to the need of users for new and specialized tools and services such as CD-ROMs, viewing equipment, professional copying services and the digital conversion of collections.

Many ways to generate revenue were identified, among them:

(i) the creation of a fund into which fees are paid when a triggering event occurs (for example, the lending of a book by a library);

(ii) the use of a tax incentive to achieve specific objectives (for example, the cost of donating a master print); and

(iii) introduction of user fees for goods and services.

Globalization of markets and technological development have created new markets for audio-visual products, resulting in increased commercial value. The impact on audio-visual archives is found in requests for new services: copying and retrieval of audio-visual material, often on a same-day basis.

5. Options to Enhance Use and Access

Some options were identified to facilitate access to and enhance the use of audio-visual heritage material:

(i) Create a **comprehensive catalogue** including public and private sector holdings of audio-visual archival material;

(ii) Adopt **descriptive standards** to create a common language;

(iii) Link existing computerized information retrieval systems;

(iv) Develop a means of systematically producing consultation/reference copies;

(v) Create an electronic document delivery service through on-line services;

(vi) Introduce user fees to cover the costs of providing service to clients;

(vii) Develop a mechanism to involve users on an on-going basis in order to respond to changing needs.

ANNEX G

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